

Norstar Plus

11

Norstar-PLUS Modular ICS 1.1 Installer Guide

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Regulations

Radio-frequency interference



Equipment generates RF energy

This equipment generates, uses, and can radiate radio-frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules and with CSA C108.8, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. Each Norstar key telephone system is assigned an FCC registration number and a ringer equivalence designation. The number and designation are printed on the Integrated Communication System (ICS) label.

Registration

The Norstar key telephone system is registered with the FCC based upon compliance with Part 68 of its rules. Connection of the Norstar key telephone system to the nationwide telecommunications network is made through a standard network interface jack that you can order from your telephone company. Jacks for this type of customer-provided equipment will not be provided on party lines or coin lines.

Interconnect

Norstar equipment meets all applicable requirements of the US Federal Commission FCC Part 68 and has been registered under files FCC AB6CAN-20705-KF-E (key system) and AB6CAN-20706-MF-E (hybrid system).

A DOC label identifies certified equipment. Certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. It does not guarantee that the equipment will operate to the user's satisfaction.

Ringer Equivalence Number

The FCC Registration Label, on the front of the Integrated Communication System (ICS), includes the ringer equivalence number (REN). This number shows the electrical load that your Norstar ICS requires from your telephone line. If the ICS requires more electrical current than your telephone company's central office equipment can provide, your telephones may not ring and you may have difficulty dialing telephone numbers.

Call the telephone company to find out the total REN allowed for your telephone line(s).

Hearing-aid compatibility

Norstar wireline telephones are hearing-aid compatible, as defined in Section 68.316 of Part 68 FCC Rules.

Electromagnetic compatibility

Norstar Modular equipment meets all FCC Part 15, class A radiated and conducted emissions requirements.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Safety

Norstar Modular equipment meets all applicable requirements of the US Underwriter's Laboratory UL-1459 Issue 2, and has been registered under file UL E 115515.

Telephone company registration

It is usually not necessary to call the telephone company with information on the equipment before connecting the Norstar Integrated Communication System (ICS) to the telephone network. If the telephone company requires this information, provide the following:

- telephone number(s) to which the Integrated Communication System (ICS) will be connected
- FCC registration number (on label affixed to ICS)
- ringer equivalence number (REN)
- universal service order code (USOC)
- service order code (SOC)
- facility interface code (FIC)

Before installing the equipment, the user should ensure that it is permissible to connect it to the local telephone company facilities. The equipment must be installed using an acceptable method of connection. However, using an acceptable method of connection may not prevent degradation of service in some situations.

Trunk Cartridge	REN	USOC	SOC	FIC
Loops Start - NT7B75GA-93 Call Information - NT5B41GA-93	AC 1.5B DC 0.3	RJ21X	9.0F	02LS2
DTI - NT7B74GA-93	0.0	RJ48C	6.0Y	04DU9-1SN
E&M - NT5B38GA-93	0.0	RJ2HX	9.0F	TL32M
DID - NT5B37GA-93	0.0B	RJ21X	9.0F	02RV2-T



Notify service provider if DTI is disconnected

You must notify your T1 service provider any time the 1.544 Mbps DTI interface is disconnected from the network.

Use of a music source

In accordance with U.S. Copyright Law, a license may be required from the American Society of Composers, Authors and Publishers, or similar organization if Radio or TV broadcasts are transmitted through the Music On Hold or Background Music features of this telecommunication system.

Nortel (Northern Telecom Inc.) hereby disclaims any liability arising out of the failure to obtain such a license.

Rights of the telephone company

If the system is causing harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, the telephone company will notify you in advance. If advance notice is not practical, the user will be notified as soon as possible. The user will be given the opportunity to correct the situation and you will be informed of your right to file a complaint to the FCC.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your system. If it does this, the user will be notified in advance to give you the opportunity to maintain uninterrupted telephone service.

If the user makes any repairs or alterations to this equipment, or if the equipment malfunctions, the telephone company may request that the equipment be disconnected.

Repairs

In the event of an equipment malfunction, all repairs will be performed by Northern Telecom Inc. or by one of its authorized dealers.

To return equipment for repair in North America, call 1-800-321-2649. You will receive a return advice number (RA#) to include with your returned equipment.

Address of repair facilities**USA**

Northern Telecom Inc.
Nashville Repair Distribution Center
640 Massman Drive
Nashville, TN
37210
RA# _____

Canada

Northern Telecom Canada Ltd.
30 Norelco Drive
Weston, Ontario M9L 2X6
Attn.: Repair Department

What's new with Norstar

New equipment

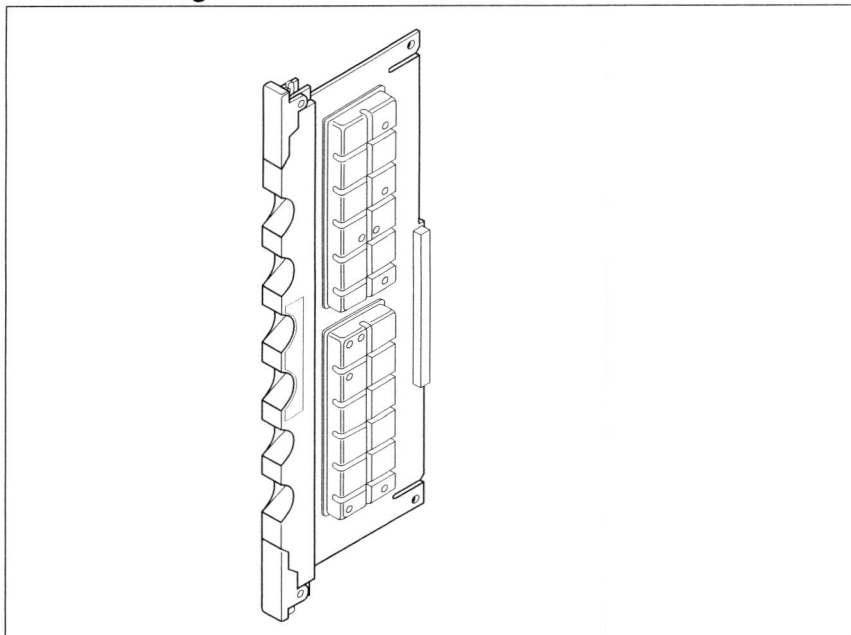
The Norstar 0X32 system has new equipment with improved performance to meet your growing telecommunication needs.

Note: Previous users of the Norstar 0X32 system should note that the Key Service Unit (KSU) has been renamed the Integrated Communication System (ICS).

The Combo Cartridge

The Combo Cartridge combines the functionality of a Services Cartridge (required for T1 trunks) and a six-port Fiber Expansion Cartridge. This new cartridge allows you to expand your 0X32 Integrated Communication System (ICS) by 6 fiber ports. As a result, the ICS now supports up to 128 Norstar telephones for MICS-DR1.1, and 192 Norstar Telephones for MICS-XC 1.1. A dual configuration, such as installing two Combo Cartridges in the ICS, is also supported to create a 12-port digital system.

Combo Cartridge



Each Combo Cartridge can be fiber optically connected to either an existing North American fiber Station Module or Trunk Module. Copper wiring is supported for analog systems only, and is expandable by six-ports maximum (eight ports total).

The Norstar 0X32 system still allows you to install any combination of Digital Trunk Interfaces (DTIs) to provide up to 48 digital T1 trunks. In addition, you can still install Loop Start or Call Information (CI) Trunk Cartridges to provide up to 12 analog lines. Your existing Trunk Module and Station Module provide the same basic functionality as the original modules. Fiber connectors are still used for connections to the slim Expansion Cartridges using fiber cables.

Ground start T1 trunks

Ground start T1 trunks offer the same features as loop start trunks, but are used when the local service provider does not support disconnect supervision for the digital loop start trunks or outbound E&M trunks. By configuring lines as ground start, the system will be able to recognize when a call is released at the far end.

Enhanced features

ATA Answer Timer

The ATA Answer Timer determines how many seconds, after the last digit is dialed, that the ATA considers the call answered. Until recently, there was a fixed seven-second delay. Now you can shorten or lengthen the delay depending on the requirements of the device attached to the ATA. Facsimile machines and credit card sets, for example, require a three second delay.

Automatic Daylight Savings Time

When this feature is turned on, your system will automatically switch between standard time and daylight savings time. Daylight savings appears in Configuration programming under 5.Miscellaneous.

Auxiliary Ringer

By setting the existing auxiliary ringer prompts on lines and sets, the Norstar system now lets you select whether an auxiliary ringer rings every time a telephone receives a call, or only when that call is received directly.

Call Park

Up to now when you parked a call, the Norstar system assigned a two digit number between 01 and 09 to retrieve that call. The Modular ICS 1.1 system now assigns a Call Park prefix, which may be any number from 1 to 9 and a two digit call number between 01 and 25. With more codes available, the system now has greater capability in parking calls and allowing users to retrieve them during busy call times.

By default, the system is configured to assign the lowest code available. The second option is for the system to assign codes in a cyclical fashion, one by one, from the lowest to the highest. The second option may help to prevent confusion when the same codes are used over and over.

Expanded Routing service

Norstar's Automatic Route Selection allows you to program 500 destination codes for Routing Service and 999 routes.

Last Number Redial

Up to now Last Number Redial was available for all telephones on a system wide basis. Now you can change the ability of a particular telephone to use Last Number Redial. This helps to ensure that only authorized users can view access codes or passwords.

Link Feature

You can change a telephones ability to use Link (a host system signaling option).

Message Indicator

A Message indicator option has been added for telephones attached to Analog Station Modules (ASMs) on the Norstar system. The message indicator may either be a tone or a lamp depending on the capabilities of the set.

North America numbering plan

To reflect the new North American numbering scheme, the default restriction filters have been updated. Filter 01 has combined exception 003 and 004 into a single exception 003 to allow long distance directory assistance calls. Area codes can now have any digit from 0 to 9 as a second digit.

Page tone

The tone preceding a Page Announcement up to now was always on. Now it is possible to turn the Page tone off for all users. This is convenient if the office environment is often busy with Page Announcements.

Page Timeout

You can now specify the amount of time required before a Page Announcement session expires. Longer announcements can be completed without having to re-page the other party. This feature enhancement appears in Configuration programming under Call Handling.

Ringling service

You can designate as many as 30 extended ringing sets for each Service Mode. In addition, Ring Groups have been added to simplify programming. You can add extended ringing sets to a ring group, which is then used by one of six Service Modes. Up to 100 Ring Groups are available for each Service Mode.

Saved Number Redial

Up to now Saved Number Redial was available for all telephones on a system wide basis. Now you can change the ability of a particular telephone to use Saved Number Redial. This helps to ensure that only authorized users can view access codes or passwords.

Set programming confirmation

Norstar-PLUS Modular ICS now provides a confirmation that programming changes have taken affect for each Norstar set, after exiting a programming session. When Configuration or Administration programming affects set data, those Norstar sets which are busy with calls during the programming session may not be updated immediately. You are now able to determine from an administration set which users must end their calls for the programming changes to take full affect.

Startup templates

The Modular ICS 1.1 system currently allows you to select a startup template to use following system startup. The two startup templates available for use with the XC 1.1 system (Canada and USA) are PBX and DID. The DID template is now available to CDA-MICS-XC 1.1 customers. The DR 1.1 system continues to offer Square, Centrex, Hybrid, PBX and DID templates following system startup.

User Preferences

User Preferences programming allows you to program memory buttons, speed dial codes and other settings for any Norstar telephone on the system.

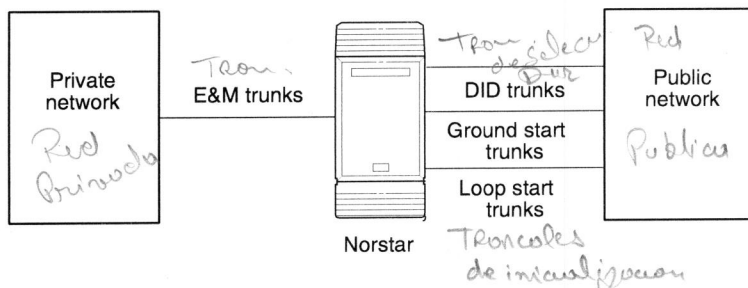
For example, an employee may want to have the Do Not Disturb feature programmed onto a memory button or create a speed dial code. Instead of programming from the employee's telephone, you can go into programming on the telephone nearest you to make the change.

Networking with Norstar

In addition to public network connections, Norstar can be integrated into an existing private network or to other Norstar systems to form a corporate telecommunications network.

The Big Picture

Norstar uses enhanced trunking to join other Norstar or customer equipment in a private network. Authorized users can also access tie lines, central office lines, and Norstar features from outside the Norstar system.



Callers in the Norstar system can:

- call directly to a specific Norstar telephone,
- select an outgoing tie line to access a private network,
- select an outgoing tie line to access features that are available on the private network,
- select an outgoing central office line to access the public network, and
- use all of the Norstar features.

Callers in the public network can:

- call directly to one or more Norstar telephones,
- call into the Norstar system and select an outgoing tie line to access a private network,
- call into the Norstar system and select an outgoing central office line to access the public network, and
- call into the Norstar system and use remote features.

Callers in the private network can:

- call directly to one or more Norstar telephones,
- call into the Norstar system and select an outgoing tie line to access other nodes in a private network,
- call into the Norstar system and select an outgoing central office line to access the public network, and
- call into the Norstar system and use remote features.

Norstar as an OPX

Norstar can be used as an off-premise extension (OPX) from a PBX. In order to support this application, the OPX lines must be engineered not to exceed 8 dB total loop loss from the serving central office to the demarcation point at the Norstar ICS.

Trunks and target lines

Trunks are external lines that provide the physical connection between a Norstar system and other systems in a private or public network. Trunks are numbered 001 to 120 (in a fully expanded system). Norstar supports 4 different types of trunks:

- Loop start trunks handle incoming and outgoing calls between Norstar and the public network.
- E&M trunks handle incoming and outgoing traffic between the Norstar system and the private network.
- DID trunks route incoming calls from the public network directly to telephones within Norstar, without an attendant.
- DTI trunks are digital trunks that can be configured to act as loop start, ground start, E&M, or DID trunks depending on your requirements.

Target lines are virtual communication paths between trunks and Norstar telephones. They are incoming lines only, and cannot be selected for outgoing calls. With 192 target lines in a fully expanded system, you can concentrate incoming calls on fewer trunks. Target lines are numbered 121 to 312 in a fully expanded system and 121 to 248 in all others.

Telephones can be configured to have an appearance of any type of trunk and line (including target lines).

Loop start trunks

Loop start trunks give you incoming and outgoing access to the public network. Loop start trunks can be configured as manual-answer or auto-answer. The answer mode determines how the system handles incoming calls.

When a call comes in on a manual-answer loop start trunk, it alerts at all telephones with that line appearance.

When a call comes in on an auto-answer loop start trunk that is configured to answer with direct inward system access (DISA), the caller hears a stuttered dial tone. They must enter a 6-digit Class of Service password from a DTMF telephone to access system dial tone. Once the caller has system dial tone, they can then enter a target line number, a line pool access code, or a remote feature code.

By default, auto answer loop start trunks are configured to answer with DISA, and are used to provide controlled access to Norstar system resources.

When a call comes in on an auto-answer loop start trunk that is not configured to answer with DISA, the caller hears system dial tone. They can then enter a target line number, the DISA DN (the number that will call for a Class of Service password), a line pool access code, or a remote feature code from a DTMF telephone.

To place an outgoing call, a loop start line can be selected by pressing a line button on the telephone, dialing a line pool access code, or pressing a memory button that has been programmed with a line pool access code.

Tips

Loop start signaling is supported by Loop Start Trunk Cartridges, Call Information (CI) Trunk Cartridges and Digital Trunk Interfaces (DTI). Each Loop Start Trunk Cartridge or CI Trunk Cartridge can provide four loop start trunks. A DTI can provide up to 24 loop start trunks. If you wish to configure your loop start trunks as auto-answer, the trunks must have disconnect supervision.

For Loop Start or CI Trunk Cartridges installed in a Trunk Module, you will also need one E&M/DISA Trunk Cartridge for every two loop start trunks that you configure as auto-answer. The E&M/DISA Trunk Cartridge provides two DTMF receivers to receive the incoming digits from the central office. An auto-answer loop start trunk can give you the same kind of direct inward dialing function as a DID trunk.

If your system includes both loop start trunks and DID trunks, you would typically use loop start trunks for outgoing calls and DID trunks for incoming calls.

You may configure a loop start trunk as the prime line for a Norstar telephone.

The capabilities available to a remote caller are determined by the remote filters and remote package assigned to a line, or by the user filters, line filters and remote package assigned to the Class of Service password.

Two loopstart trunk cartridges are compatible with MICS XC 1.1. The NT5B40GA-93 can be installed in trunk module (TM) slots only. The NT7B75GA-93 can be installed in either Core slots three or four, or TM slots one, two or three.

Ground start trunks

Ground start trunks offer the same features as loop start trunks, but are used when the local service provider does not support disconnect supervision for the digital loop start trunks.

By configuring lines as ground start, the system will be able to recognize when a call is released at the far end.

Tips

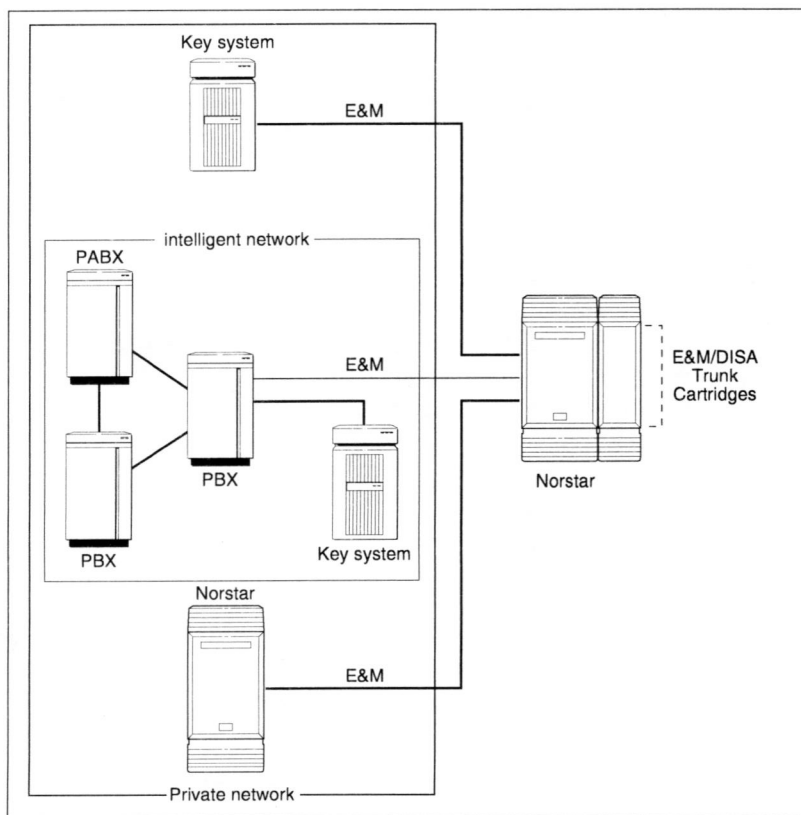
You cannot change the trunk mode for a ground start trunk on a DTI. It always has disconnect supervision.

Ground start trunks are provided only by a DTI. Analog ground start trunks are not supported.

E&M trunks

An E&M trunk gives you incoming and outgoing access to other systems in a private network. E&M trunks can be configured as manual-answer or auto-answer. The answer mode determines how the system handles incoming calls.

By default, auto-answer E&M trunks are answered by the system with direct inward system access (DISA), and are used to provide controlled access to Norstar system resources.



When a call comes in on a manual-answer E&M trunk, it alerts at all telephones with that line appearance.

When a call comes in on an auto-answer E&M trunk that is configured to answer with DISA, the caller hears stuttered dial tone. They must enter a 6-digit Class of Service password from a DTMF telephone to hear system dial tone. They can then enter a target line number, a line pool access code, or a remote feature code.

When a call comes in on an auto-answer E&M trunk that is not configured to answer with DISA, the caller hears system dial tone. They can then enter a target line number, the DISA DN (the number that will call for a Class of Service password), a line pool access code, or a remote feature code from a DTMF telephone.

To place an outgoing call, an E&M trunk can be selected by pressing a line button on the telephone, dialing a line pool access code, or pressing a memory button that has been programmed with a line pool access code.

Tips

Each E&M/DISA Trunk Cartridge can provide two E&M trunks. A DTI can provide up to 24 E&M trunks.

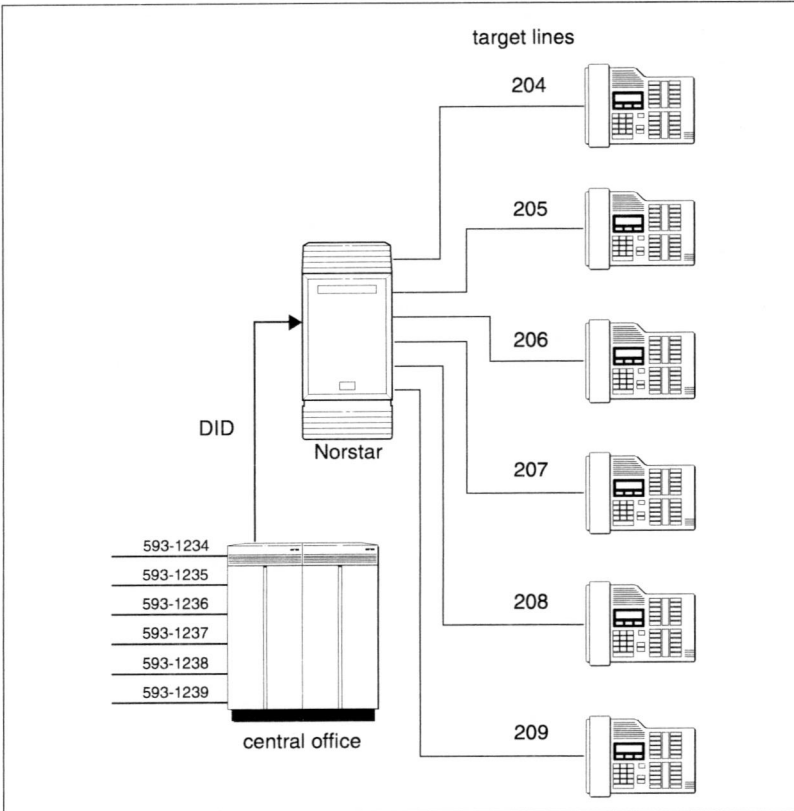
For Loop Start or CI Trunk Cartridges installed in a Trunk Module, you need one E&M/DISA Trunk Cartridge for every two loop start trunks that you configure as auto-answer. The E&M/DISA Trunk Cartridge provides two DTMF receivers to receive the incoming digits from the central office.

You can configure an E&M trunk as the prime line for a Norstar telephone.

The capabilities available to a remote caller are determined by the remote filters and remote package assigned to a line, or by the user filters, line filters and remote package assigned to the Class of Service password.

DID trunks

DID trunks give you direct inward dialing (DID) from the public network. A typical application of these trunks is to map incoming digits onto target line appearances within the Norstar system. DID trunks can operate only as auto-answer trunks.



When a call comes in on a DID trunk, the Norstar system interprets the incoming digits in one of the following ways.

- If the digits map onto a target line, the call is routed to all telephones with an appearance of that target line.

- If the digits map onto the DISA DN, the caller hears stuttered dial tone. They must enter a 6-digit Class of Service password from a DTMF telephone to hear system dial tone. They can then enter a target line number, a line pool access code, or a remote feature code.
- If the digits map onto the Auto DN, the caller hears system dial tone. They can then enter a target line number, the DISA DN (the number that will call for a Class of Service password), a line pool access code, or a remote feature code from a DTMF telephone.

Tips

Each DID Trunk Cartridge can provide four DID trunks. Each DID Trunk Cartridge also has four DTMF receivers dedicated to those trunks. A DTI can provide up to 24 DID trunks.

You cannot configure a DID trunk as the prime line for a Norstar telephone.

The capabilities available to a remote caller are determined by the remote filters and remote package assigned to a line, or by the user filters, line filters and remote package assigned to the Class of Service password.

Target lines

A target line is a specific communication path that is reached by means of digits received from an incoming trunk. Target lines are used to answer incoming calls but cannot be used to make outgoing calls.

You can program auto-answer loop start and E&M trunks, and DID trunks to map to target lines to provide for attendant bypass (calling directly to a department or individual) and line concentration (one trunk can map onto several target lines).

With all templates except the DID template, by default no target lines are assigned to sets.

Target lines are referred to by line numbers (121-312 or 121-248) in the same way as physical lines.

Remote system access

The remote access feature allows callers elsewhere on a private network, or on the public network, to access a Norstar system by dialing directly without going through an attendant. Once on the system, the remote user can use some of the system's resources.

Norstar systems support remote system access on the following trunk types which may require the remote caller to enter a password for direct inward system access (DISA):

- auto-answer loop start trunks
- auto-answer E&M trunks
- DID trunks (by means of the DISA DN).

The system resources (dialing capabilities, line pool access and feature access) that a remote user may access depends on the Class of Service assigned to them. Refer to the description of Class of Service in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for more details.

Remote access on loop start and E&M trunks

Loop start trunks provide remote access to Norstar from the public network; E&M trunks provide remote access from a private network. Each must be configured to be auto-answer (in Trunk data programming) to provide remote system access.

A loop start trunk **must** have disconnect supervision if it is to operate in auto-answer mode. E&M trunks always operate in disconnect supervised mode.

When a caller dials into the system on a line that has auto-answer, the system answers with system dial tone and no Class of Service (COS) password is required. In this case, control over the system capabilities available to the caller is provided only by the dialing filters assigned to the line.

When a caller dials in on a line that has auto-answer with DISA, the system answers with stuttered dial tone. This is the prompt to enter a COS password which determines which system capabilities are available to the caller.

Remote access on a private network

Nodes on the private network deliver the last dialed digits to the destination Norstar node, for interpretation by the destination Norstar node. The destination Norstar node either matches the digits to a target line or interprets the digits as a remote feature request. The call is either routed to the specified target line, or the remote feature is activated.

By default, E&M trunks are set to answer with DISA. For auto-answer E&M trunks connected to a private network, change the default so that the trunks are **not** answered with DISA.

If an auto-answer E&M trunk is configured to answer with DISA, the system tries to interpret any received digits as a COS password.

The DISA DN and the Auto DN allow auto-answer private network and DID calls, in the same way that calls on auto-answer loop start and auto-answer E&M trunks can be answered, with or without DISA. These DNs are described in Configuration Programming under heading 6. Miscellaneous.

Remote access on Direct Inward Dial (DID) trunks

Remote system access on DID trunks is similar to that of E&M trunks connected to a private network. The main differences are:

- a remote caller is on the public network dialing standard local or long-distance telephone numbers
- the digits received are delivered by the central office
- DISA cannot be administered to a DID trunk

As with a private network, the dialed digits may be programmed to match those of a specific target line DN, the DISA DN or the Auto DN.

Benefits

Security

In the Capabilities section of Administration programming, there are several ways of protecting your Norstar system from unauthorized access or use.

Class of Service

Class of Service refers to the capabilities that Norstar provides to users who access the system from the public or private network. The Class of Service includes:

- filters that restrict dialing on the line, and
- an access package, which defines the set of line pools that may be accessed and whether or not the user has access to the paging feature.

The Class of Service that is applied to an incoming remote access call is determined by:

- the filters that you apply to the incoming trunk, or by
- the Class of Service password that the caller used to gain access to the Norstar system.

In cases where DISA is not automatically applied to incoming calls, the remote caller can change the Class of Service by dialing the DISA DN and entering a Class of Service password.

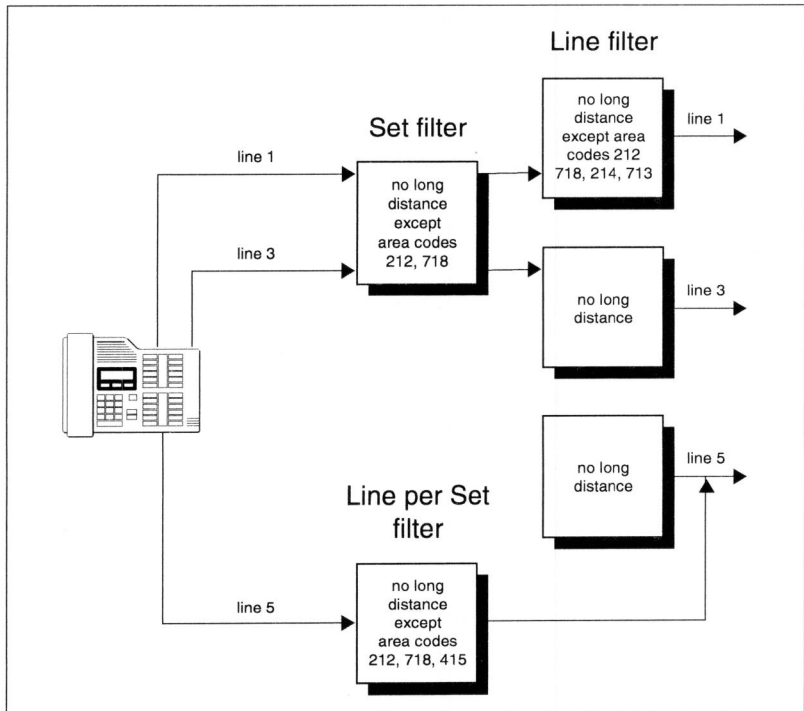
To program Class of Service passwords, see the Programming chapter in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*.

Dialing filters

You can use dialing filters to restrict the numbers that may be dialed on any external line within your Norstar system. You may specify up to 100 dialing filters for the system. A dialing filter consists of up to 48 restrictions and their associated exceptions.

To restrict dialing within the system, you can apply dialing filters to outgoing external lines (as line filters), to telephones (as set filters), and to external lines on specific telephones (as line per set/filters).

Dialing filters can also be specified in Restrictions service for times when the system is operating according to a Service Mode. Refer to the description of Service Modes in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for more details.



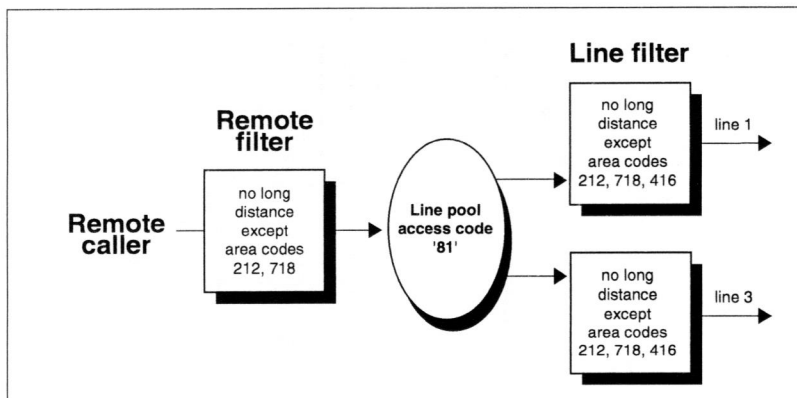
Dialed digits must pass both the line filter and the set filter. The line per set filter overrides the line filter and set filter.

In this diagram, a caller using line 1 could only dial long-distance numbers to area codes 212 and 718. A caller using line 3 could not dial any long-distance numbers. A caller using line 5 could dial long-distance numbers to area codes 212, 718, and 415.

Tips

Set filters have no effect on numbers dialed on an E&M trunk.

To restrict dialing outside the system (once a caller gains remote access), you can apply dialing filters to incoming external lines (as remote filters).



In this case, dialed digits must pass both the remote filter and the line filter. A remote caller can override these filters by dialing the DISA DN and entering a Class of Service password.

For dialing filter programming instructions, see the Programming chapter in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*.

Direct inward system access (DISA)

To control access from the public or private network, you can configure auto-answer trunks to answer with DISA. Remote callers hear a stuttered dial tone and must then enter a Class of Service password that determines what they are allowed to do in the system.

Auto-answer loop start and E&M trunks are configured to answer with DISA by default.

Tips

You must have one E&M/DISA Trunk Cartridge to provide DTMF receivers for every two auto-answer loop start trunks on Loop Start or CI Trunk Cartridges.

DID trunks cannot be configured to answer with DISA. If you want incoming DID calls to be answered with DISA, configure the system with a DISA DN. Incoming DID calls that map onto the DISA DN are then routed to a line that has DISA.

For DISA programming instructions, see the Programming chapter.

Transparent dialing plan

The Norstar system has a routing feature that allows you to set up a transparent or coordinated dialing plan with other systems in a public or private network. The goal is to have a network-wide dialing plan where all DN numbers are unique and of a uniform length.

Dialing plans are typically used with a network of systems with three to seven digit dialing access between them.

Any programming for routing should be carefully planned using the tables supplied with the *Programming Record*. The settings for routing and destination codes are fully explained in the Programming section of this guide. This section deals with applying the programming in network situations.

Dialing plan using public lines

The examples in the illustrations show the *Programming Record* for the New York system in a network of three offices: New York, Toronto and Santa Clara. Without routing, a Norstar user in New York would have to select a line pool and dial 1-416-555-5555 to reach extension 27 in Toronto (416). By creating a destination code of 30 and creating a route that uses the proper line pool and DialOut, the user simply dials 3027. The same feature is available for Santa Clara (604).

In the DialOut, P stands for pause, a host system signalling option. Press Feature 7 8 to insert a 1.5 second pause in the dialing string. See the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for information about other signals.

To record more than 48 routes, photocopy this page BEFORE using.

 **Define routes** (A. Configuration: 3. Routing)

Route # (001-999)	Use pool	DialOut (if required) (max. 24 digits or characters)
100	A B C D E F G H I J K L M N O	1-9-901-586-30
101	A B C D E F G H I J K L M N O	1-9-901-586-31
102	A B C D E F G H I J K L M N O	1-9-604-646-32
103	A B C D E F G H I J K L M N O	1-9-604-646-33
	A B C D E F G H I J K L M N O	
	A B C D E F G H I J K L M N O	

Page 10

To record more than 40 destination codes (max. 50)

 **Destination codes** (A. Configuration: 3. Routing)

Service Mode	Normal	Mode 1	Mode 2	Mode 3
Mode name (max. 7 char.)	Normal	Night	Evening	Lunch
Use digit absorb? (max. 2 modes only)	X	X		
DestCode (max. 7 digits)	Absorb length	Use route (001-999)		
9	All 0 999 001			
1	All 1 999 002			

Destination code numbering in a network

Because the system checks the initial digits of a call against the routing tables, each type of internal or external call must begin with a distinct digit. The following table gives a sample plan for how initial digits are assigned in a network of systems with three-digit intercom numbers.

Digit	Use
0	Network Direct Dial
1	Long Distance Calls
2	Intercom calls
3	Intercom calls
4	Coordinated Dialing Plan
5	Unused
6	Unused
7	External Access Code
8	Call Park Prefix
9	Local Calls

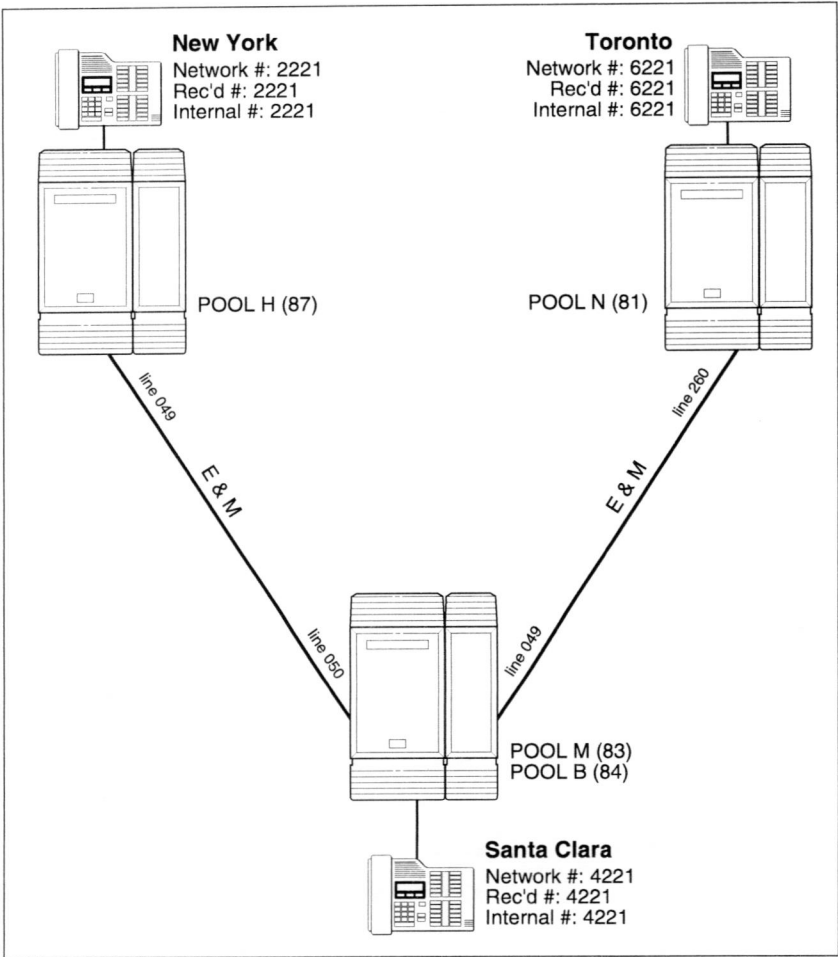
In the example, 4 is used as the initial digit for the Coordinated Dialing Plan, but 5 or 6 could also be used for this purpose.

Dialing plan using E&M lines

By properly planning and programming routing tables and destination codes, an installer can create a dialing plan where:

- all extension numbers in the network are the same length
- an extension can be reached using an extension number regardless of where the call originates in the network
- E&M lines between Norstar systems are available to other systems in the network

The following figure and programming chart shows how a transparent dialing plan for a network of three Norstars. Each system must be running Norstar-PLUS DR 1.1, XC 1.1, or more recent software. Each system must be equipped with target lines and a Trunk Module with an E&M/DISA Trunk cartridge or an ICS with a DTI with at least one E&M line.



Heading	Parameter	Setting
New York:		
1. Trk/Line Data	Line 049	E&M
	Ans Mode	Auto
	Line type	Pool H
	Line 245	Target line
	Rec'd #	2221
2. Line Access	Set 2221	L245: Ring only
	Line pool access	Line pool H
5. Miscellaneous	Line pool codes	Line pool H: 87
To Santa Clara:		
3. Routing	Route	001
	Use	Pool H
	DialOut	4
	DestCode	4
	Normal rte	001
To Toronto:		
3. Routing	Route	002
	Use	Pool H
	DialOut	84-P-6
	DestCode	6
	Normal rte	002
Santa Clara:		
1. Trk/Line Data	Line 050	E&M
	Ans Mode	Auto
	Line type	Pool M

Heading	Parameter	Setting
1. Trk/Line Data	Line 049	E&M
	Ans Mode	Auto
	Line type	Pool B
	Line 250	Target line
	Rec'd #	4221
2. Line Access	Set 4221	L250: Ring only
	Line pool access	Line pool B Line pool M
5. Miscellaneous	Line pool codes	Line pool B: 84
	Line pool codes	Line pool M: 83
To New York:		
3. Routing	Route	001
	Use	Pool M
	DialOut	2
	DestCode	2
	Normal rte	001
To Toronto:		
3. Routing	Route	002
	Use	Pool B
	DialOut	6
	DestCode	6
	Normal rte	001
<i>In Admin. programming:</i>		
5. Capabilities	Rem access pkgs	01

Heading	Parameter	Setting
	Line pool access	Pool M: ON
	Rem access pkgs	02
	Line pool access	Pool B: ON
	Line abilities	049
	Remote pkg	01
	Line abilities	050
	Remote pkg	02
Toronto:		
1. Trk/Line Data	Line 053	E&M
	Ans Mode	Auto
	Line type	Pool N
	Line 260	Target line
	Rec'd #	6221
2. Line Access	Set 6221	L260: Ring only
	Line pool access	Line pool N
3. Miscellaneous	Line pool codes	Line pool N: 81
To New York:		
3. Routing	Route	001
	Use	Pool N
	DialOut	4
	DestCode	4
	Normal rte	001
To Santa Clara:		
3. Routing	Route	002
	Use	Pool N

Heading	Parameter	Setting
	DialOut	83-P-2
	DestCode	2
	Normal rte	002

If a user in New York wishes to call Toronto within the network, he or she dials 6221. The local Norstar checks the number against the routing tables and routes the call according to the destination code 6, which places the call using Route 002.

When the DialOut is added to the number by the New York system, the call appears on the auto answer line on the Norstar in Santa Clara as 84-pause-6-221. Because 84 is a line pool access code, the call is placed using line pool B. The routing service reads the 6 as a direction to use Route 002.

The DialOut for the Route 002 of the Santa Clara system restores the number to 6221. This maps to Received digits in Toronto and the call rings at the internal extension 221.

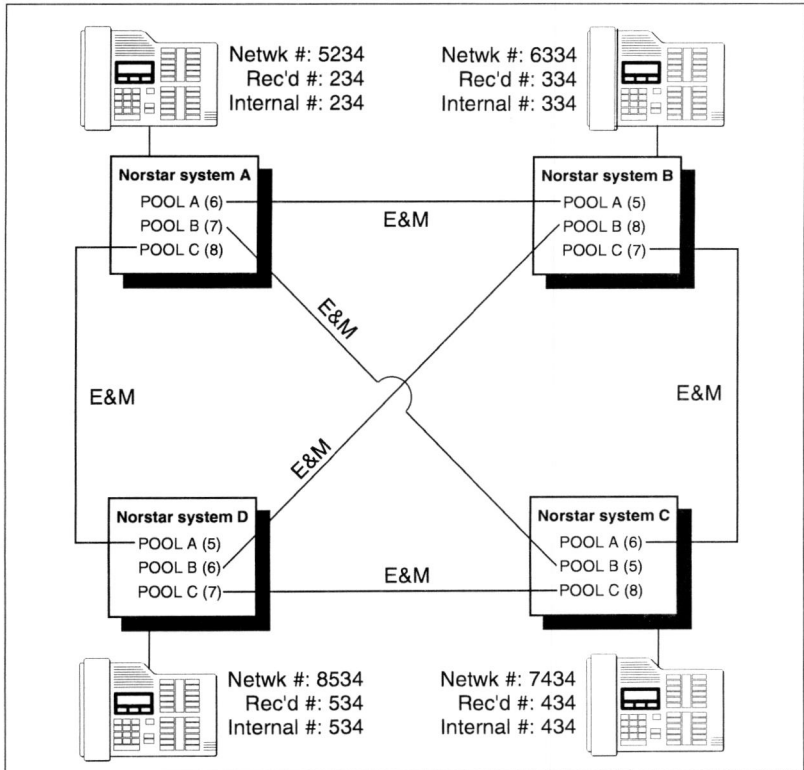
Dialing plans with shared line pools

Using routes and destination codes is a powerful and efficient way to create a transparent dialing plan. Line pools offer an alternate method of creating a dialing plan or supplementing the routing and destination codes.

If the Norstar systems are close to each other geographically, you can conserve resources by not duplicating access. For example, system A, B, and C are all within the same area code. System A has a line pool to Santa Clara, System B has a line pool to Montreal, and system C has a line pool to Miami. A Norstar user in system A can reach Miami by calling system C and using their line pool to Miami.

To simplify access between Norstar systems, all line pools that go to the same destination should have the same line pool access code. For example, system A and system B both have a line pool to Ottawa. You can configure both systems with the same line pool access code for the Ottawa line pool.

A dialing plan similar to the one in the following figure will let you create a company directory that uses line pool access codes and unique DNs of a uniform length.



For instance, the person on system A at telephone 234 can press an Intercom button and dial 7434.

This means that telephone 234 has dialed the line pool access code of the trunk to system C, and will receive the dial tone of system C. The digits 434 then map to the Received number 434, and ring telephone 434 with an appearance of the associated target line.

Tips

Network calls that use routes are subject to any dialing filters in that are in effect.

If the telephone used to make a network call has an appearance of a line used by the route, the call will move from the intercom button to the line button.

The telephone used to make a network call must have access to the line pool used by the route.

Network calls are external calls, even though they are dialed as if they were internal calls. Only the features and capabilities available to external calls can be used.

When programming a button to dial a Network number automatically (autodial), network calls must be treated as external numbers, even though they resemble internal extension numbers.

Routes generally define the path between your Norstar switch and another switch in your network, not other individual telephones on that switch.

Customer Use

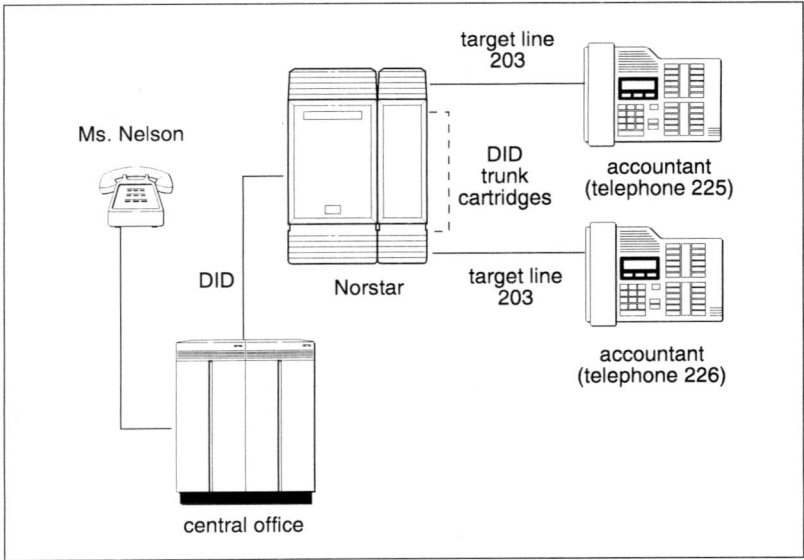
This section shows sample configurations for different types of network access. Each example has four parts:

- A scenario explains the caller's goal and what is required to achieve it.
- A diagram shows the network configuration that supports the application.
- A list shows the Norstar hardware required to support the configuration.
- Tables show the Configuration and Administration programming required. Only those settings that are important to network access are described here.

In the public network

Call one or more Norstar telephones

Ms. Nelson is a bank customer who has a question for an accountant. She dials the telephone number that maps onto target line 203. All of the accountants' telephones ring.

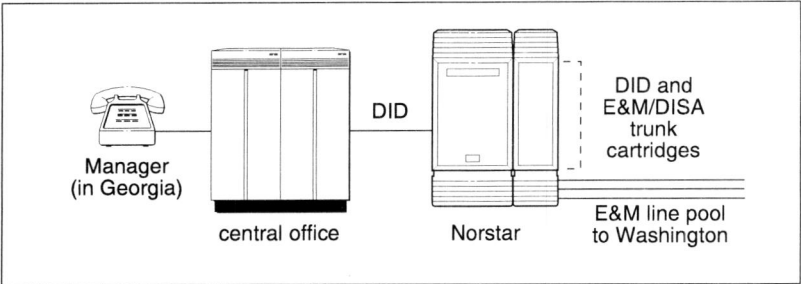


Hardware: ICS, a Trunk Module with a DID Trunk Cartridge, or a DTI with lines programmed as DID.

Heading	Parameter	Setting
1. Trk/Line Data	Rec'd # Line 051	4321 (for Line 203) DID
System Data	Rec'd # length	4 digits (can be from 2 to 7 digits, but must match number of digits sent by central office)

Call Norstar and select tie lines to a private network

A manager in Georgia wants to use the tie lines at headquarters to call Washington. He dials a telephone number that maps onto the DISA DN, enters a Class of Service (COS) password, then dials a line pool access code to select a tie line to Washington.

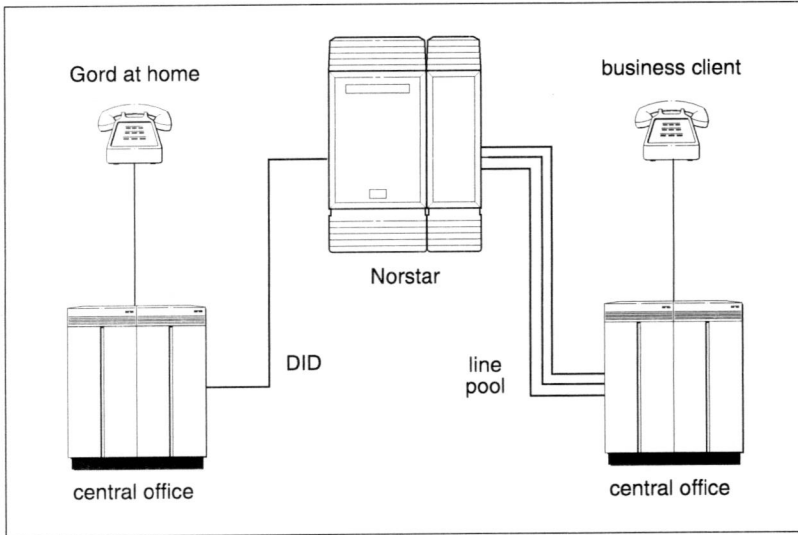


Hardware: ICS, a Trunk Module with a DID Trunk Cartridge, two E&M/DISA Trunk Cartridges (for the three trunks in the line pool to Washington) or a DTI with one DID line and three E&M lines.

Heading	Parameter	Setting
<i>Incoming trunk:</i>		
1. Trk/Line Data	Line 049	DID
5. Miscellaneous	DISA DN	5321
System Data	Rec'd # length	4 digits (can be from 2 to 7 digits, but must match number of digits sent by central office)
<i>Outgoing trunk:</i>		
1. Trk/Line Data	Line 053 Line type	E&M Pool F
5. Miscellaneous	Line pool F	6 (up to 4 digits)
5. Capabilities		Define filters. Define remote access pkgs. Assign a dialing filter to the line. Assign COS passwords and filters for each class of service.

Call Norstar and select lines to the public network

Gord wants to make a long-distance business call from home. To avoid being charged, he dials the telephone number that maps onto the Auto DN at work. After hearing the dial tone, Gord dials a line pool access code to select a line to the public network. He then dials the long-distance number.



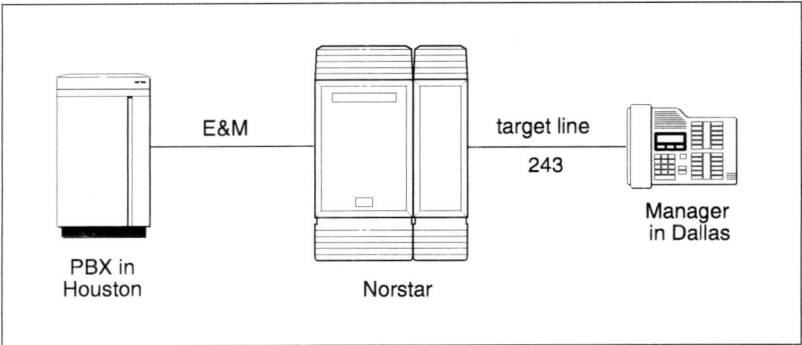
Hardware: ICS, a Trunk Module with a DID Trunk Cartridge or DTI with several DID lines.

Heading	Parameter	Setting
<i>Incoming trunk:</i>		
1. Trk/Line Data	Line 049	DID
5. Miscellaneous	Auto DN	4321
System Data	Rec'd # length	4 digits (can be from 2 to 7 digits, but must match number of digits sent by central office)
B. General admin		Define dialing filters.
5. Capabilities		Define remote access packages. Assign a remote filter and remote package to the line.
<i>Outgoing trunk:</i>		
1. Trk/Line Data	Line 001	Loop
	Line type	Pool A
5. Miscellaneous	Line pool A	1234
B. General admin		Assign a dialing filter to the line.
5. Capabilities		

In the private network

Call one or more Norstar telephones

The production supervisor in Houston selects the less-expensive company tie line to call the manager at the Administration office in Dallas. Once the line is selected, the production supervisor dials the digits that will map onto the target line of the manager in Dallas.

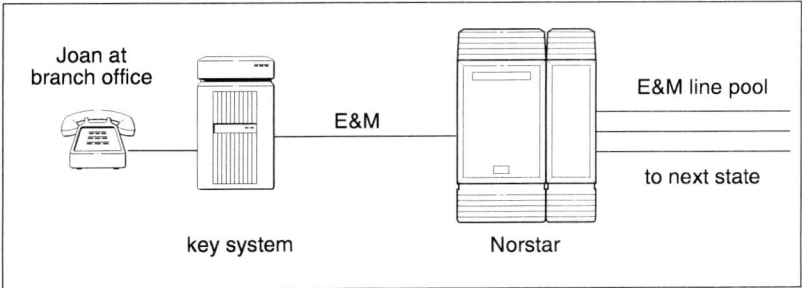


Hardware: ICS, a Trunk Module with an E&M/DISA Trunk Cartridge or a DTI with an E&M line.

Heading	Parameter	Setting
<i>Incoming trunk:</i>		
1. Trk/Line Data	Rec'd #	4321(for target line 243)
	Line 049	E&M
	Ans Mode	Auto
System Data	Rec'd # length	4 digits (can be from 2 to 7 digits, but must match number of digits sent by central office)

Call Norstar and select tie lines to other nodes in the private network

At a branch office, Joan selects a tie line to the main office downtown. After hearing the dial tone, she dials a line pool access code to select another tie line to a branch office in the next state.

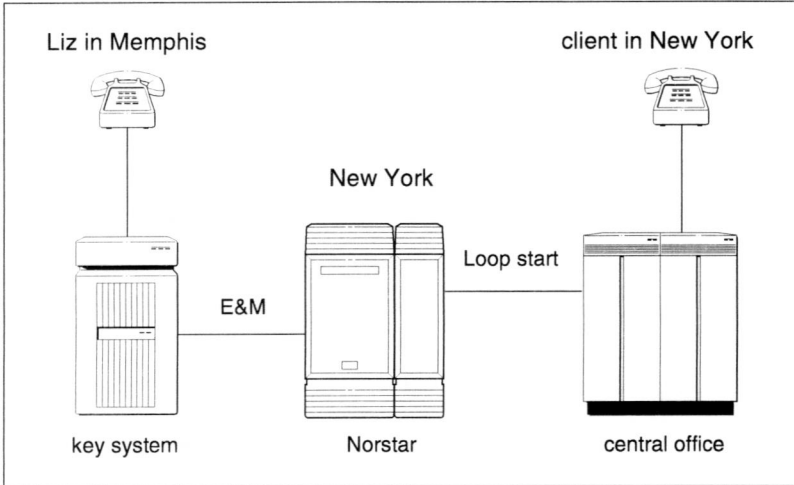


Hardware: ICS, a Trunk Module with two E&M/DISA Trunk Cartridges (for the three lines in the line pool and the one incoming line) or a DTI with four E&M lines.

Heading	Parameter	Setting
<i>Incoming trunk:</i>		
1. Trk/Line Data	Line 049 Ans mode	E&M Auto
B. General admin 5. Capabilities		Define dialing filters. Define remote access packages. Assign a remote line filter and remote package to the trunk.
<i>Outgoing trunk:</i>		
1. Trk/Line Data	Line 050 Line type	E&M Pool D
5. Miscellaneous	Line pool D	71 (can be from 1 to 4 digits)
B. General admin 5. Capabilities		Assign a dialing filter to the trunk.

Call Norstar and select lines to the public network

Liz in Memphis, needs to call long-distance to a client in New York. She selects a tie-line to the branch office in New York. After hearing the dial tone, she dials a line pool access code to select a line to the public network. Then, she dials the client's number as a local call.



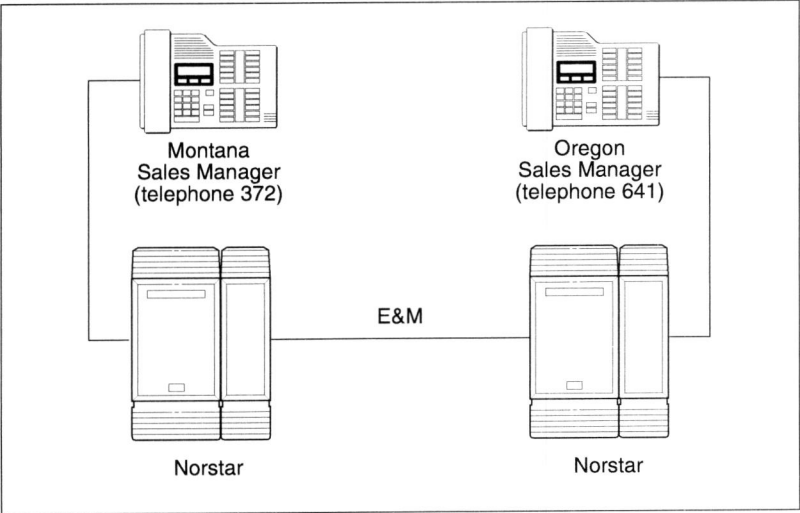
Hardware: ICS, a Trunk Module with an E&M/DISA Trunk Cartridge or DTI with an E&M line.

Heading	Parameter	Setting
<i>Incoming trunk:</i>		
1. Trk/Line Data	Line 049 Ans mode	E&M Auto
B. General admin 5. Capabilities		Define dialing filters and remote access packages. Assign a remote filter and remote package to the trunk.
<i>Outgoing trunk:</i>		
1. Trk/Line Data	Line 001 Line type	Loop Pool B
5. Miscellaneous	Line pool B	73 (can be 1 to 4 digits)
B. General admin 5. Capabilities		Assign a dialing filter to the line.

In the Norstar system

Select E&M trunks to the private network

For a confidential call, the Montana sales manager presses the line button for a private E&M trunk to the Oregon office. This automatically alerts at the line appearance on the telephone of the Oregon sales manager.

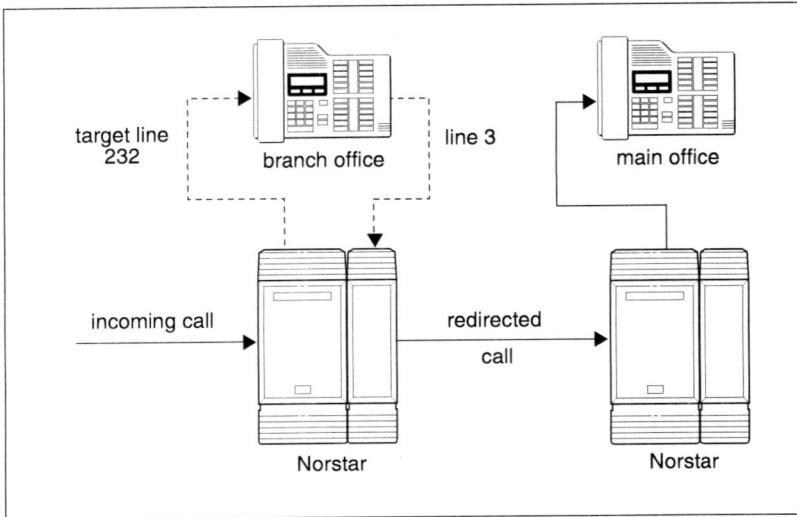


Hardware: (for both systems) ICS, a Trunk Module with an E&M/DISA Trunk Cartridge or a DTI with an E&M line.

Heading	Parameter	Setting
Montana:		
<i>Outgoing trunk:</i>		
Trunk Data (Line 049)	Line	E&M
Line Data (Line 049)	Line type	Private to 372
Oregon:		
<i>Incoming trunk:</i>		
Trunk Data (Line 057)	Line	E&M
	Ans mode	Manual
	Line type	Private to 641

Norstar Line Redirection feature

The branch office is receiving more calls than it can handle, so it redirects one of its lines to the main office. All calls that come in on target line 232 will be routed out on line 003 to the main office. Whenever a call is redirected, the target line and outgoing line will be busy for the duration of the call.



Hardware: ICS, an E&M/DISA Trunk Cartridge if the incoming trunk is E&M or a DID Trunk Cartridge if the incoming trunk is DID, or a DTI with one E&M line or one DID line.

Tips

Any line appearance on a telephone can be selected as the incoming line to be redirected. Dialing Filter restrictions on the line are checked against the filter in effect at the time a call is redirected not when redirection is programmed.

A target line can not be selected as the outgoing line for redirection.

The incoming trunk must have disconnect supervision.

Program heading	Setting
<i>Incoming trunk:</i>	
1. Trk/Line Data	Line 001: Loop Trunk mode: Super Ans mode: Auto OR Line 049: DID OR Line 053: E&M Ans mode: Auto Rec'd #: 4321 (for target line 232)
System Data	Rec'd # length: 4 digits (can be from 2 to 7 digits, but must match number of digits sent by central office)
<i>Outgoing trunk:</i>	
1. Trk/Line Data	Line 003: Loop OR Line 054: E&M
<i>Branch office set:</i>	
B. General admin	
5. Capabilities	Allow redirect: Y

Planning the installation

Planning checklist

- ☐ Verify that you have all the equipment and supplies you need to install the system.
- ☐ Determine the location for the Integrated Communication System (ICS) and expansion modules, telephones and other equipment.
- ☐ Select the default template to be used in System Startup programming. See the Programming chapter.
- ☐ Plan and record system programming details in the *Programming Record*.

If you are installing a system with Norstar Companion components, refer to the checklist supplied in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Required equipment and supplies for a DR 1.1 system

- ☐ Integrated Communication System (ICS)
- ☐ Feature Cartridge
- ☐ Trunk Cartridge(s) for the ICS
- ☐ Combo Cartridge (Combined Six-port Expansion and Services Cartridge)
- ☐ Emergency telephone (2 for ICS, 1 for each TM)
- ☐ Norstar telephones
- ☐ Distribution panel(s)

Required equipment and supplies for an XC 1.1 system

- ☐ Integrated Communication System (ICS)
- ☐ Feature Cartridge
- ☐ Trunk Cartridge(s) for the ICS
- ☐ Services Cartridge (one required with Digital Trunk Interfaces; two required for busy sites), or a Combo Cartridge (provides same Services Cartridge functionality)
- ☐ Emergency telephone (2 for ICS for each TM)
- ☐ Norstar telephones
- ☐ Distribution panel(s)

Expansion equipment

- ☐ Expansion Cartridge (two-port or six-port)
- ☐ Combo Cartridge (Combined Six-port Expansion and Services Cartridge functionality)
- ☐ Trunk Module(s) (TM)
- ☐ Station Module(s) (SM)
- ☐ Trunk Cartridge(s) for the TM
- ☐ Power bar



Your Norstar system requires connection to a grounded outlet

To prevent possible injury from voltage on the telephone network, disconnect all central office and station lines before removing plug from the electrical outlet.

The Integrated Communication System (ICS) supports up to 32 telephones (no expansion). With the addition of Trunk Cartridges, you can connect up to 48 digital lines to the ICS.

With the addition of an Expansion Cartridge or a Combo Cartridge in the ICS, you can add Trunk Modules and/or Station Modules to increase your system capacity.

Installed in ICS	Additional modules allowed		
	Trunk	Station	Maximum
No Expansion cartridge (mini)	0	0	0
2-port Expansion cartridge (midi)	2	2	2
6-port Expansion cartridge (maxi)	6	6	6
Combo cartridge (6-port + Services) (maxi)	6	6	6
Combo and 6-port cartridges (mega)	6	12	12
Two Combo cartridges (mega)	6	12	12
Two 6-port cartridges (mega)	6	12	12

Configuring Trunk Cartridges

If you plan to configure lines on a Loop Start Trunk Cartridge as auto-answer, you will need an E&M Trunk Cartridge for every two auto-answer loop start lines. The E&M Trunk Cartridge provides DTMF receivers for auto-answer loop start lines.

You can install three additional Trunk Cartridges in each Trunk Module. The following table shows you the line capacity of each Trunk Cartridge.

Trunk Cartridge	Line capacity
DTI (ICS only)	24
Loop Start with disconnect supervision	4
CI	4
DID (TM only)	4
E&M (TM only)	2

You can install different types of Trunk Cartridges together in the same Trunk Module. When mixing Trunk Cartridges, use a separate block on the distribution panel for each type of Trunk Cartridge.

Configuring Station Modules

Each Station Module allows you to connect up to 16 additional Norstar telephones to the system.

mini		midi		maxi				mega		
ICS	SM3	SM4	SM5	SM6	SM7	SM8	SM9	SM10	SM11	SM12
32	48	64	80	96	112	128	144	160	176	192

Tips

The following combinations are not supported with the DR 1.1 and XC 1.1 systems:

- two 2-port expansion cartridge system (4 fiber ports total)
- a 6-port and a 2-port expansion combination (8 fiber ports total)

In a fully expanded system using 48 digital channels, consider installing 2 service cartridge functionality to prevent blocking of incoming calls due to lack of DTMF resources.

Optional equipment

- ☐ station auxiliary power supply (SAPS)
- ☐ Busy Lamp Field (BLF)
- ☐ central answering position (CAP) module
- ☐ Analog Terminal Adapter (ATA)
- ☐ uninterruptible power supply
- ☐ other

If the system will be equipped with T1 lines, use an uninterruptible power supply so that the T1 - keep alive signal will continue to be sent to the network in the event of a power failure.

Equipment for installing the ICS and expansion modules

- ☐ screwdriver
- ☐ pliers
- ☐ connecting tool
- ☐ four 19 mm (3/4 in.) wood screws for each of the mounting brackets
- ☐ 38 mm (1 1/2 in.) screws for the cable troughs (ICS - 2, TM - 4, SM - 2)
- ☐ 19 mm (3/4 in.) wood backboard (if necessary)

Location requirements

- ☐ clean, dry, and well-ventilated
- ☐ temperature between 0°C and 50°C (32°F and 122°F)
- ☐ humidity between 5% and 95%, non-condensing
- ☐ minimum distance of 4 m (13 ft.) from equipment such as photocopiers, electrical motors and other equipment that can produce electromagnetic, radio-frequency, and electrostatic interference

Electrical requirements

- ☐ non-switched outlet within reach of the ICS and modules

The ICS and module power cords are 1.5 m (5 ft.) long. You may connect the ICS and modules to a power bar. The power bar must be CSA certified and UL listed with a third ground wire. Do not use an extension cord between the ICS and the power bar, or between the power bar and the electrical outlet.

- ☐ ac outlet equipped with a third wire ground to avoid electromagnetic interference

- ☐ dedicated 110 V ac nominal, 50/60 Hz, 15 A minimum service with a third wire ground

**Check ground connections**

Ensure that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. If they are not connected together, contact the appropriate electrical inspection authority. Do not attempt to make the connections yourself.

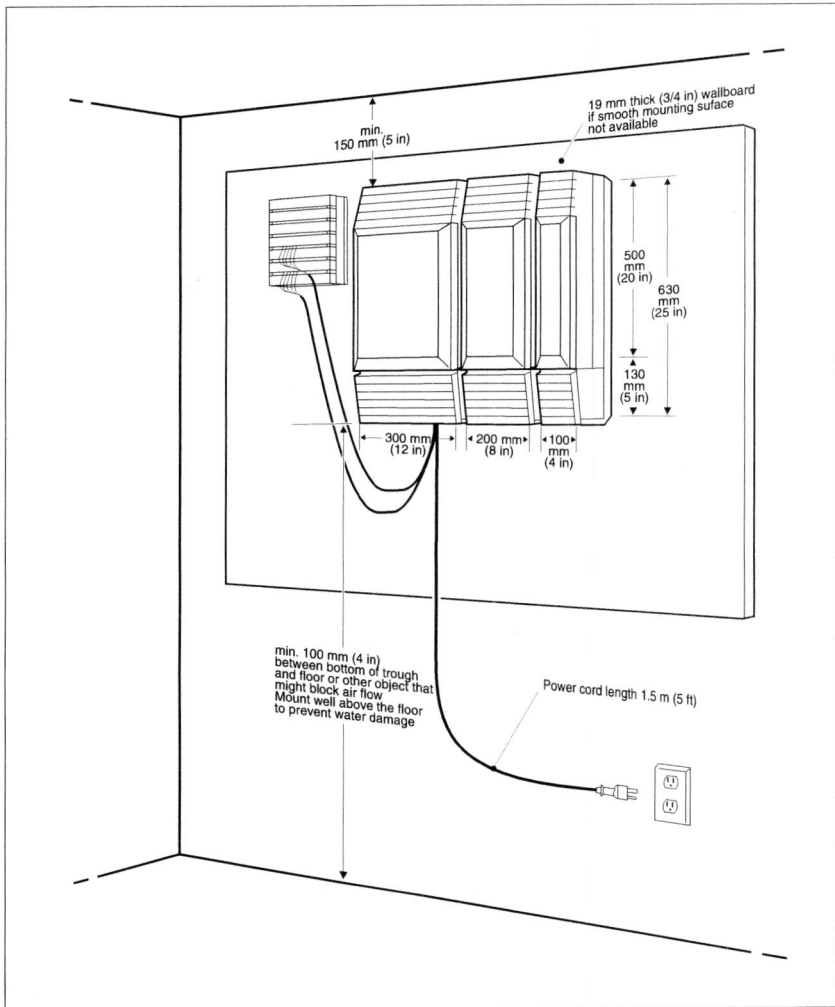
Internal wiring requirements

- ☐ one, two or three twisted pair cable per telephone
- ☐ dc loop resistance of less than 64 Ω
- ☐ cable length (0.5 mm or 24 AWG) less than 300 m (1000 ft.)
- ☐ use of a station auxiliary power supply (SAPS) for loops 300 m (1000 ft.) to 790 m (2600 ft.). The SAPS must be a Class 2 power source that is UL and CSA listed.
- ☐ no bridge taps

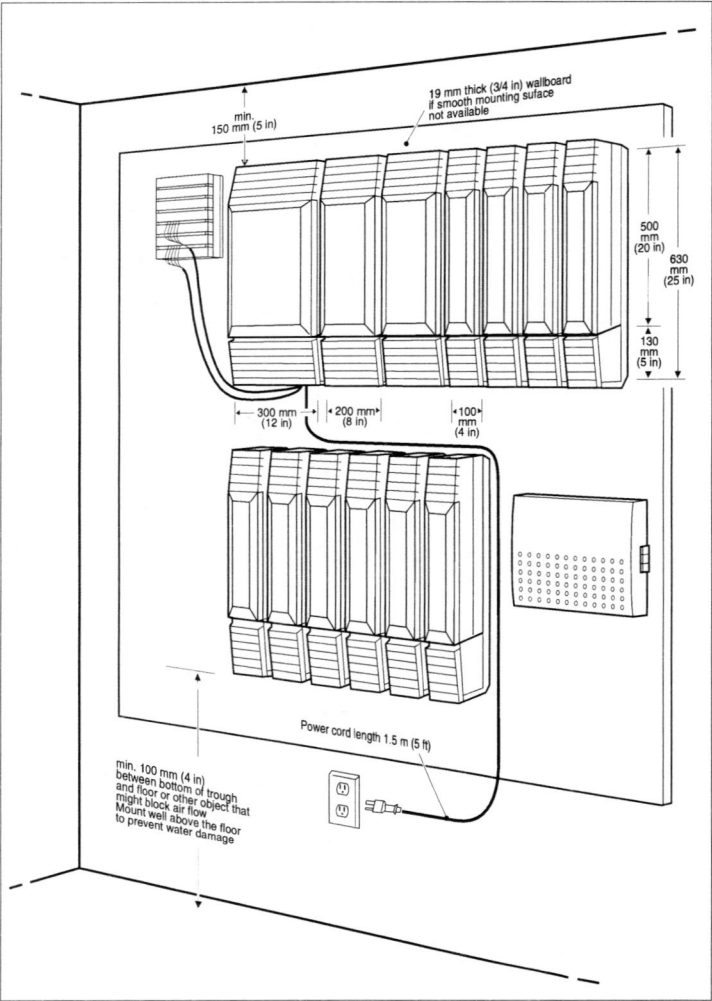
**Verify lightning protectors**

Check the lightning protectors at the cable entry point to the building with special attention to the grounding. Report any problems to the telephone company in writing. Norstar telephone wiring is not lightning protected and should therefore not leave the building.

Spacing requirements for a DR 1.1 system



Spacing requirements for an XC 1.1 system



Installation



Avoid electrical shock

To avoid electrical shock hazard to personnel, or equipment damage, observe the following precautions when installing telephone equipment:

Always disconnect telecommunication network connectors before disconnecting the ac power plug.

Never install telephone wiring during a lightning storm.

Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.



Only a qualified Installer should install a Norstar system

Installation checklist

- ☐ mount the Integrated Communication System (ICS) and expansion modules (as required)
- ☐ install the Feature Cartridge
- ☐ install the Expansion Cartridge and Trunk Cartridges (as required)
- ☐ connect the expansion modules
- ☐ complete the wiring
- ☐ install the emergency telephone(s)
- ☐ install the Norstar telephones
- ☐ install the single-line telephones
- ☐ install the optional equipment
- ☐ power up the system

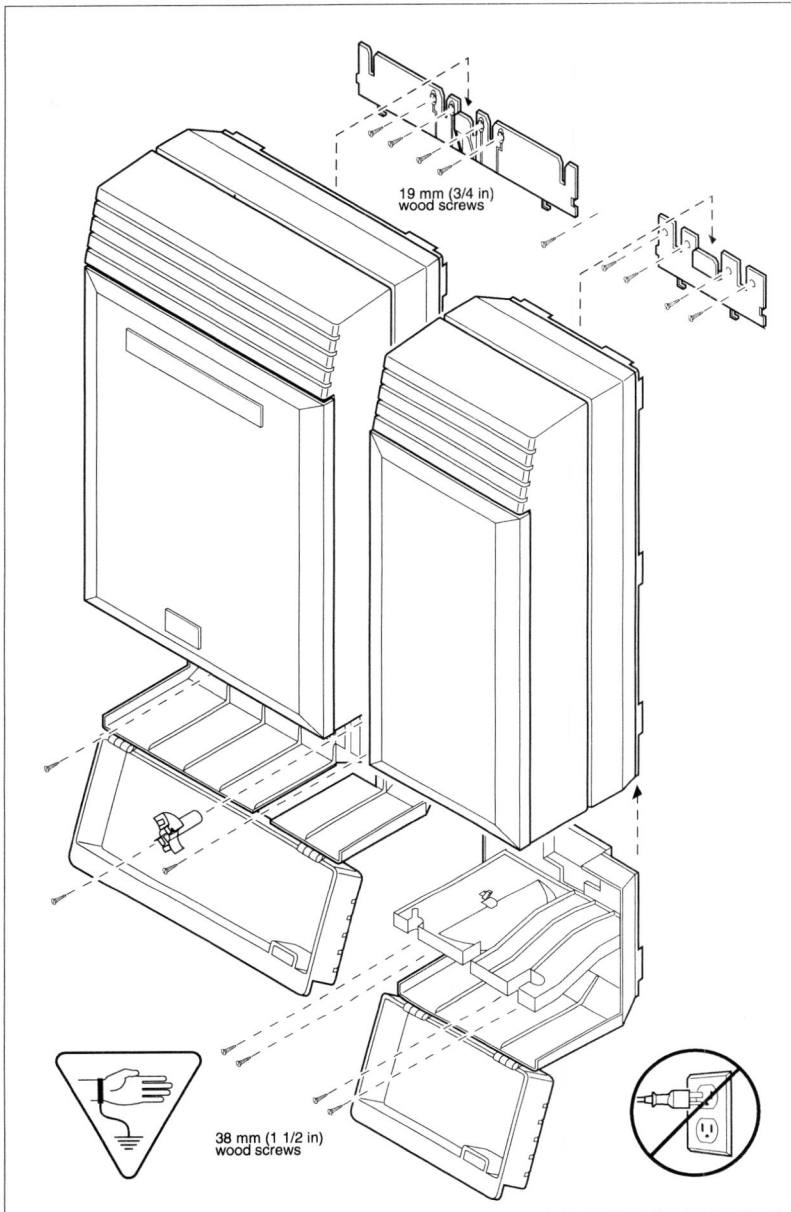


Attach brackets to secure surface

Screw the ICS and module mounting brackets to a secure surface. Do not screw brackets to drywall.

If you are installing a system with Norstar Companion components, refer to the installation chapter of the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Mounting the modules



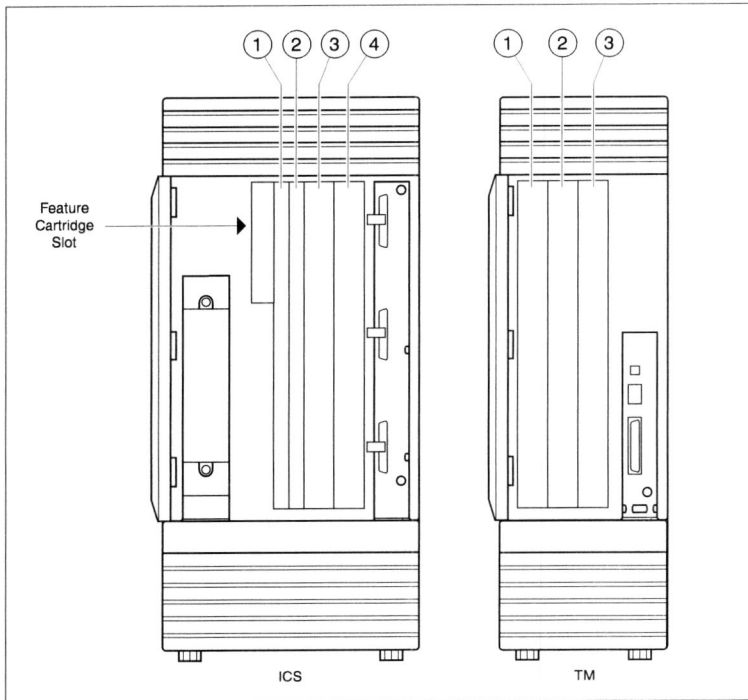
Installing the cartridges

The following table shows you which cartridges can be installed in which ICS and TM slots.

Cartridge type	Part number	ICS Slot	TM Slot
USA-MICS-XC 1.1 Feature Cartridge CDA-MICS-XC 1.1 Feature Cartridge NA-MICS-DR 1.1 Feature Cartridge	A0649679 NT7B72FD-93 A0649680 NT7B72FC-93 A0643015 NT7B72FB-93	Feature Cartridge Slot	
Services Cartridge	A0404139 NTBB24GA-93	1	
Fiber Expansion Cartridge (2-port)	A0404244 NTBB02GA-93	2	
Fiber Expansion Cartridge (6-port)	A0404245 NTBB06GA-93	1 or 2 (see note below)	
Fiber Expansion (6-port) and Services Cartridge (Combo)	A0632426 NTBB25GA-93	1 or 2 (see note below)	
Digital Trunk Interface (DTI)	A0404135 NT7B74GA-93	3 or 4	
Loop Start Trunk Cartridge	A0405799 NT7B75GA-93	3 or 4	1, 2 or 3
CI Trunk Cartridge	A0393277 NT5B41GA-93	3 or 4	1, 2 or 3
E&M Trunk Cartridge	A0359618 NT5B38GA-93		1, 2 or 3
DID Trunk Cartridge	A0359617 NT5B37GA-93		1, 2 or 3
Copper Expansion (2-port)	A0405796 NTB03GA	1	
Copper Expansion (6-port)	A0405797 NTBB07GA	1	

Note: Use Slot 1 only when installing cartridges for 12-port, fully expanded systems. In this case, both slots 1 and 2 are installed with 6-port Expansion or Combo cartridges.

The DTI supports digital T1 lines. The Loop Start Trunk Cartridge supports loop start external lines. The CI Trunk Cartridge supports Call Display features on loop start external lines. The E&M Trunk Cartridge supports E&M lines and provides direct inward system access (DISA). The DID Trunk Cartridge supports direct inward dialing lines.



Tips

For a 2-port (midi) system, a 2-port fiber Expansion Cartridge is installed only in ICS slot 2.

For a 6-port (maxi) system, a 6-port fiber Expansion Cartridge or a Combo cartridge is installed only in ICS slot 2.

When a 6-port fiber Expansion Cartridge is installed in ICS slot 2, either an additional 6-port fiber Expansion Cartridge (for a fully analog system) or a Combo cartridge can be installed in ICS slot 1 for a 12-port (mega) system.

Two Combo cartridges are supported on a mega configuration using both ICS slots 1 and 2.

For a 12-port (mega) system, any combination of the 6-port fiber Expansion and the Combo cartridge is supported using both ICS slots 1 and 2.

A copper Expansion Cartridge is a full-width cartridge and covers both ICS slots 1 and 2.

One 6-port copper Expansion Cartridge is supported for a maxi configuration and can only be installed in slot 1.

One 2-port copper Expansion Cartridge is supported for a midi configuration and can only be installed in slot 1.

An alarm and a prompt indicating warm reset will occur on the alarm telephone if an Expansion Cartridge is installed in the wrong ICS slot.

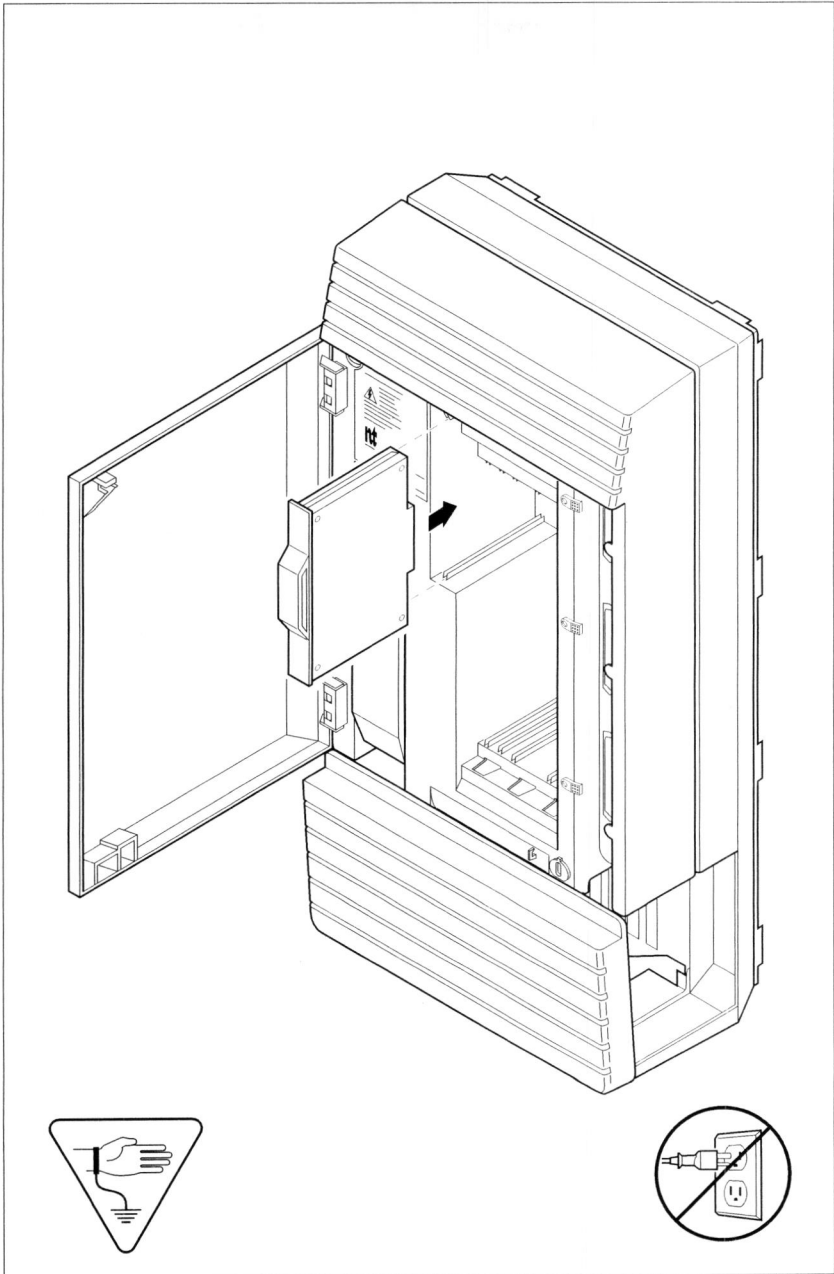
An alarm and a prompt indicating cold reset will occur on the alarm telephone when the system size has been decreased.



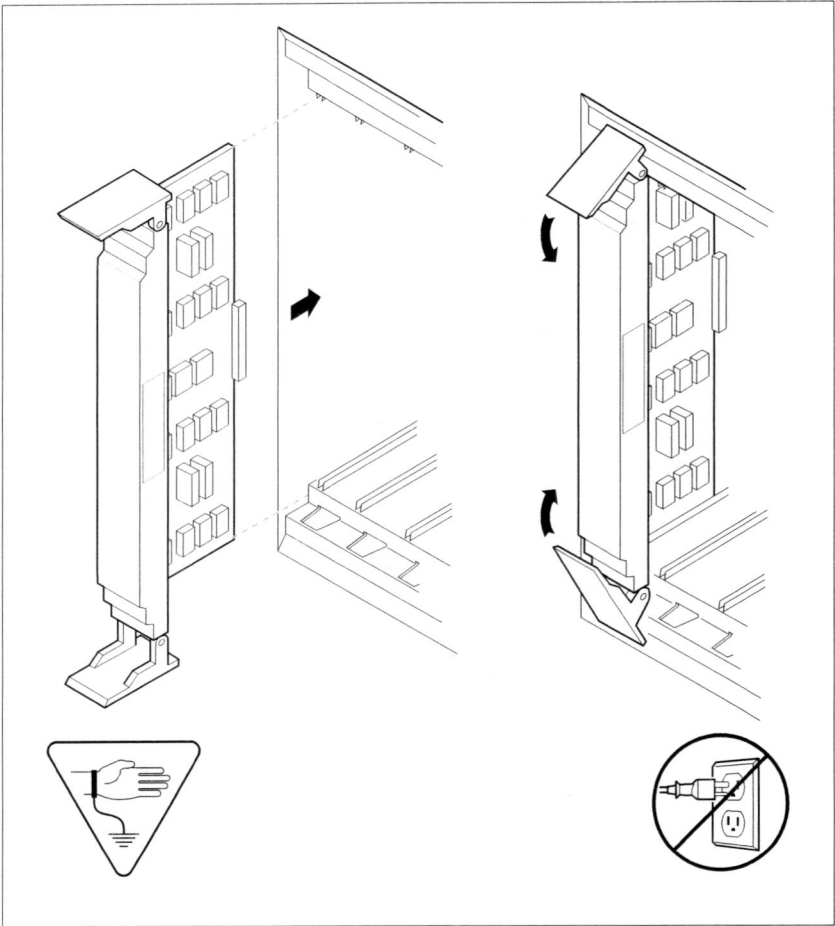
Avoid risk of electrical shock

Voltages of up to 130 V may be present on the 1.544 Mbps circuit and on portions of the DTI circuitry.

Installing the Feature Cartridge



Installing cartridges



Close clips simultaneously

It is important to center and close the two clips on the cartridge simultaneously, or the cartridge may become misaligned in its slot, or with its connector.

**PCB is electrostatic-sensitive**

Do not touch the printed circuit board on a cartridge.
This is an electrostatic-sensitive device.

Install trunk cartridges in the ICS beginning with Slot 4 then Slot 3.

Install trunk cartridges in the trunk modules beginning with Slot 1 then Slot 2 and then Slot 3.

For easier wiring, install similar type Trunk Cartridges together in the same Trunk Module.

If you install an E&M or a DID Trunk Cartridge in the left-most slot (slot 1) of a TM, emergency telephones cannot be supported for that Trunk Module.

**Alarm Telephone will indicate a warm or cold reset**

An alarm and a prompt indicating warm or cold reset will occur on the alarm telephone if an expansion cartridge is installed in the wrong ICS slot or when the system size has been decreased.

Connecting expansion modules

If your system includes fiber Trunk Modules and/or fiber Station Modules, you need to connect the modules to the Expansion Cartridge by means of fiber cables.

Order of expansion module connection

In order to keep the default port and extension numbering, connect Trunk Modules to the Expansion Cartridge beginning at the top and working down; connect Station Modules to the Expansion Cartridge beginning at the bottom and working up.

If you are expanding your system to include Companion components, see the upgrade instructions included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Tips

Ports 3 and 4 can be used for Trunk Modules or Station Modules. In this case, connect Trunk Modules beginning at the top (port 4); connect Station Modules beginning at the bottom (port 3).

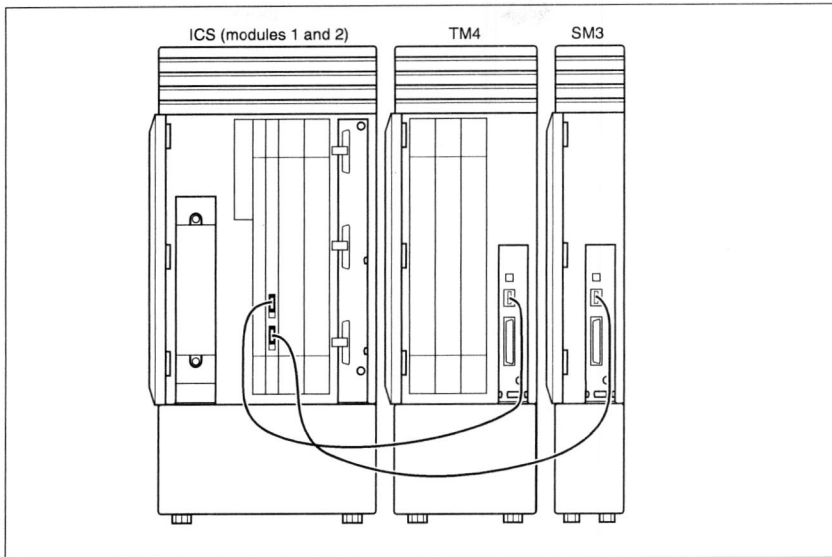
Ports 7 and 8 can be used for Trunk Modules or Station Modules. In this case, Trunk Modules would be connected beginning at the top (port 8) and working down; Station Modules would be connected beginning at the bottom (port 3) and working up.

On a fully expanded, 12-port (mega) system, connect Station Modules to the Expansion Cartridge in slot 2. In this case, Trunk Modules would be connected beginning at the top (port 8) and working down; Station Modules would be connected beginning at the bottom (port 3) and working up.

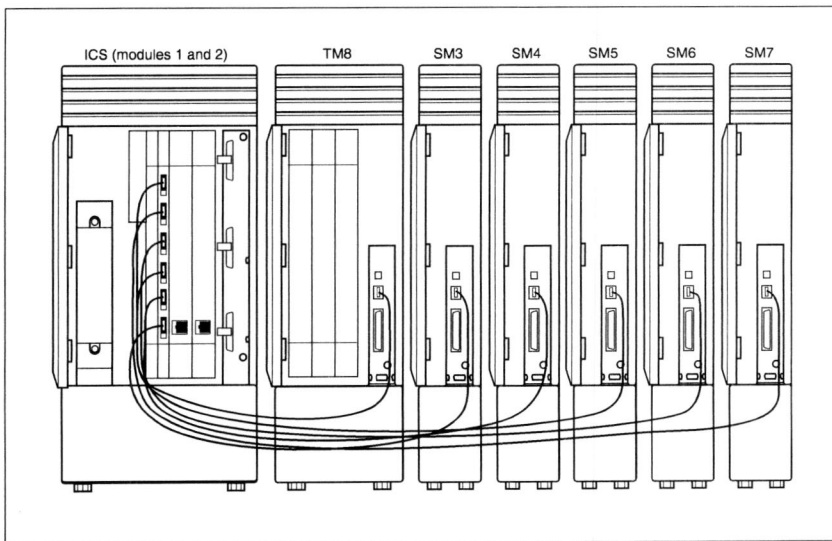
When no more Station Modules can be added to the Expansion Cartridge in slot 2, connect additional Station Modules to the Expansion Cartridge in slot 1, beginning at the bottom (port 9) and working up.

On a fully expanded, 12-port (mega) system, connect Trunk Modules to the Expansion Cartridge in slot 2, beginning at the top (port 8) and working down.

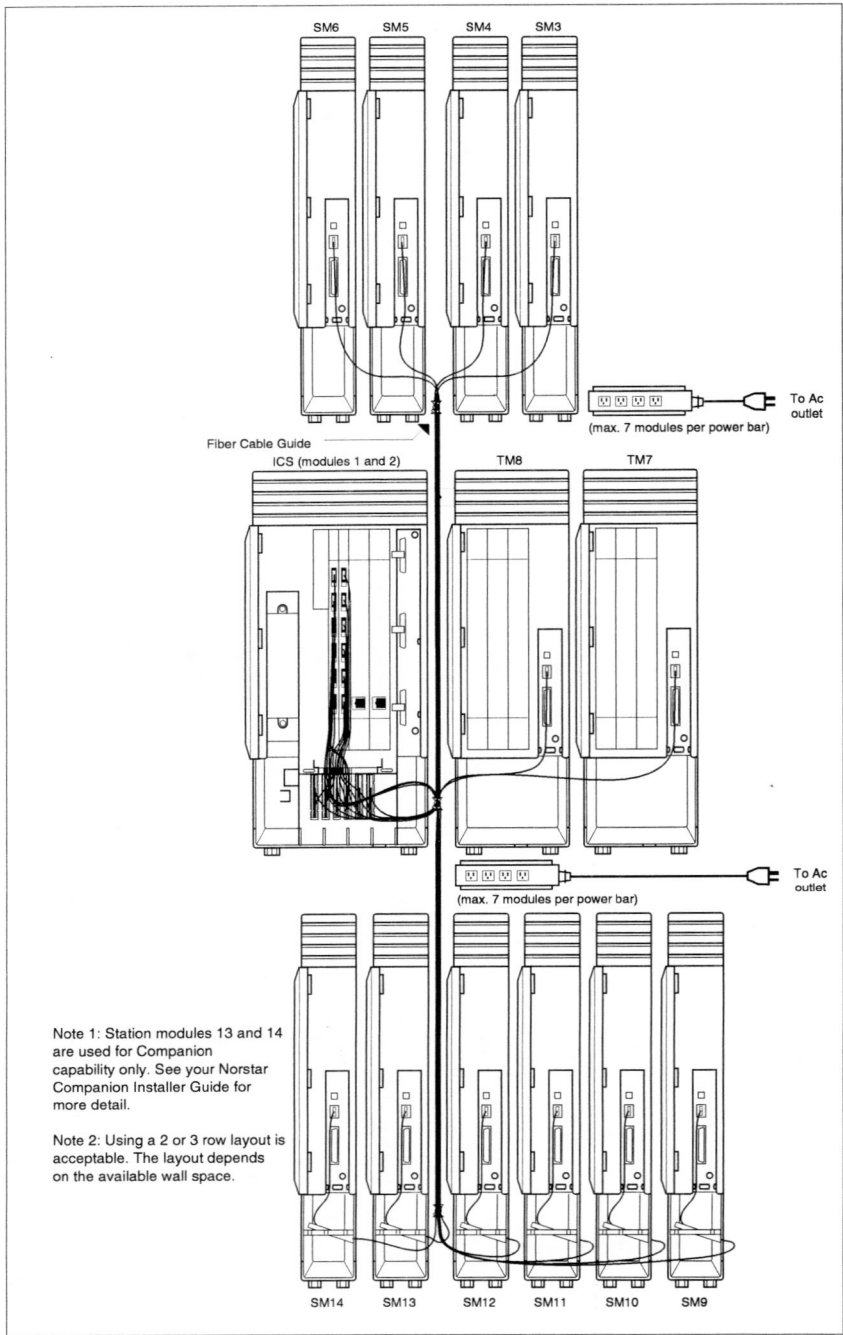
Trunk Modules cannot be connected to the Expansion Cartridge in slot 1.
Two-port Expansion Cartridge



Six-port Expansion Cartridge



12-port Expansion Cartridge (XC 1.1 system shown)



Installing fiber cables

Fiber cables are durable, but can be damaged. To avoid damage that can affect the signals transmitted, observe the following guidelines:

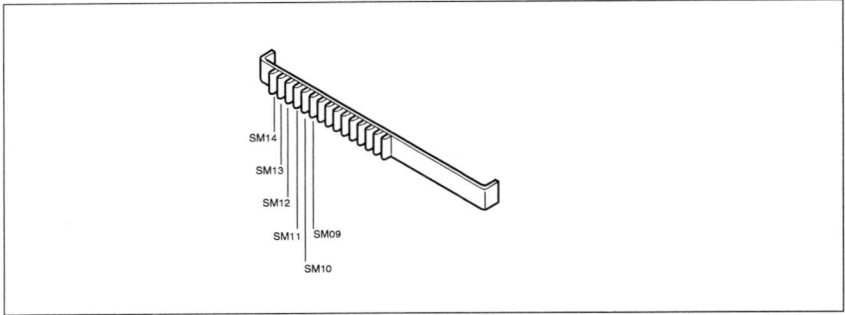
- Coil excess fiber cable on the spool provided for the installation.
- Secure the fiber cable spool in the ICS cable trough.
- Ensure that bends in the cable are no tighter than 100 mm (4 in.) in diameter.
- When using cable ties, bundle fiber cables loosely.
- Avoid excessive pulling, compression or impact.
- Do not grasp the fiber cable, or the clasp where the cable joins the plug, when connecting or disconnecting a fiber cable plug into a port.
- Do not leave fiber cables in an environment with excessively high temperatures (for example, on top of radiators).

Using the fiber cable management system

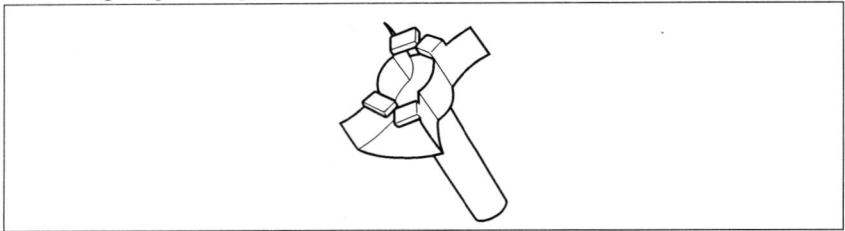
To facilitate the installation of a DR 1.1 or XC 1.1 configuration, the Fiber Cable Management System ensures that power cords are located outside of the cable tray and that a 2.6 cm (1 in.) space exists between the ICS module and other modules.

The following hardware components are used in the Fiber Cable Management System:

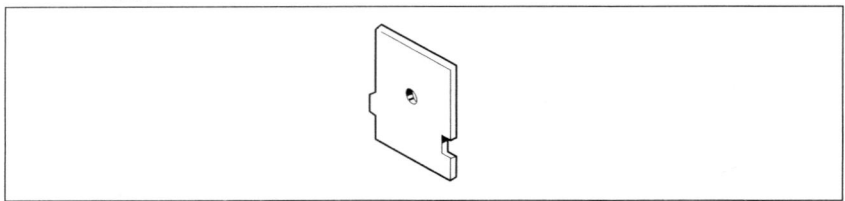
- **Fiber Comb (one per system):** The Fiber Comb, is installed, using an adhesive back, on the ICS, below the fiber expansion cartridges. The Fiber Comb keeps the fiber cable in place and prevents the cables from being pinched between doors. Use the comb to keep fiber cables organized as they are routed to each Station Module, as shown in the 12-port example below.



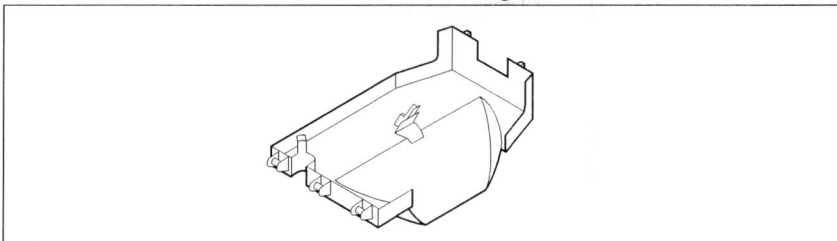
- **Fiber Cable Guide (three per system):** to be installed in the entrance and exit of the cable trough. The Fiber Cable Guide allows routing fibers to maintain a minimum bend radius when going through the cable trough.



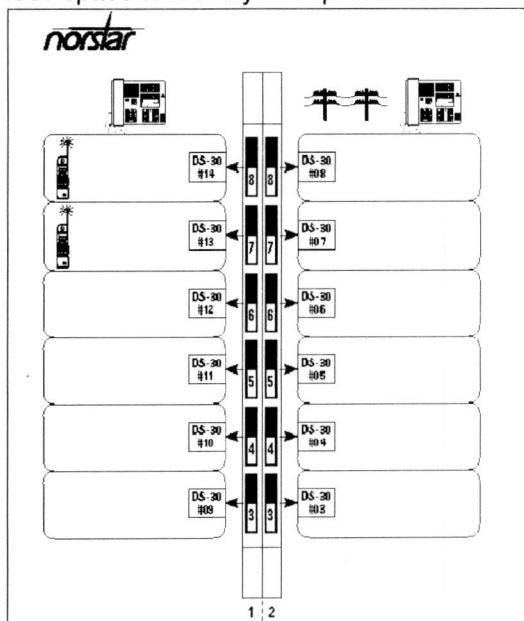
- **Spacer (three per system):** to be installed between mounting brackets of the ICS and an adjacent module. The Spacer provides a 2.6 cm (1 in.) space between modules next to the ICS.



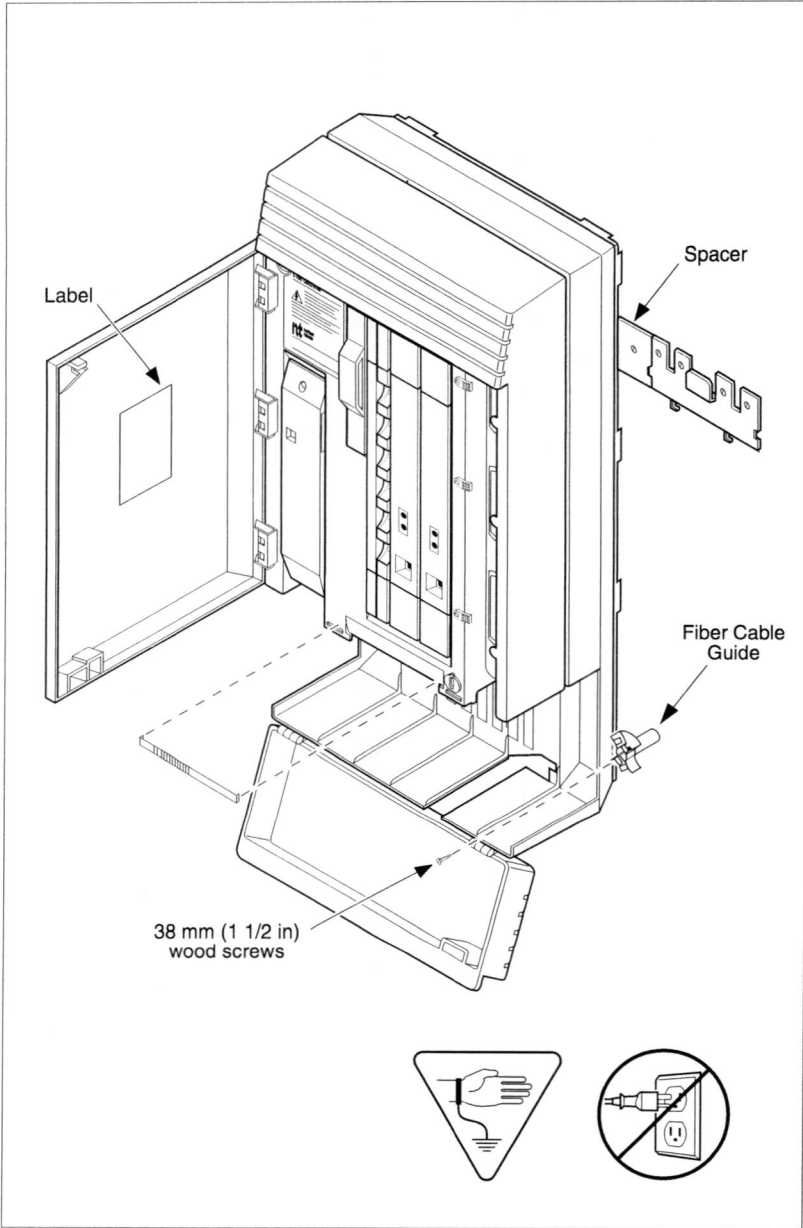
- Fiber Spool Holder (six per system):** Replaces the trough shelf in modules requiring additional fiber spools. The spool holder should be installed in the right side of a Trunk Module.



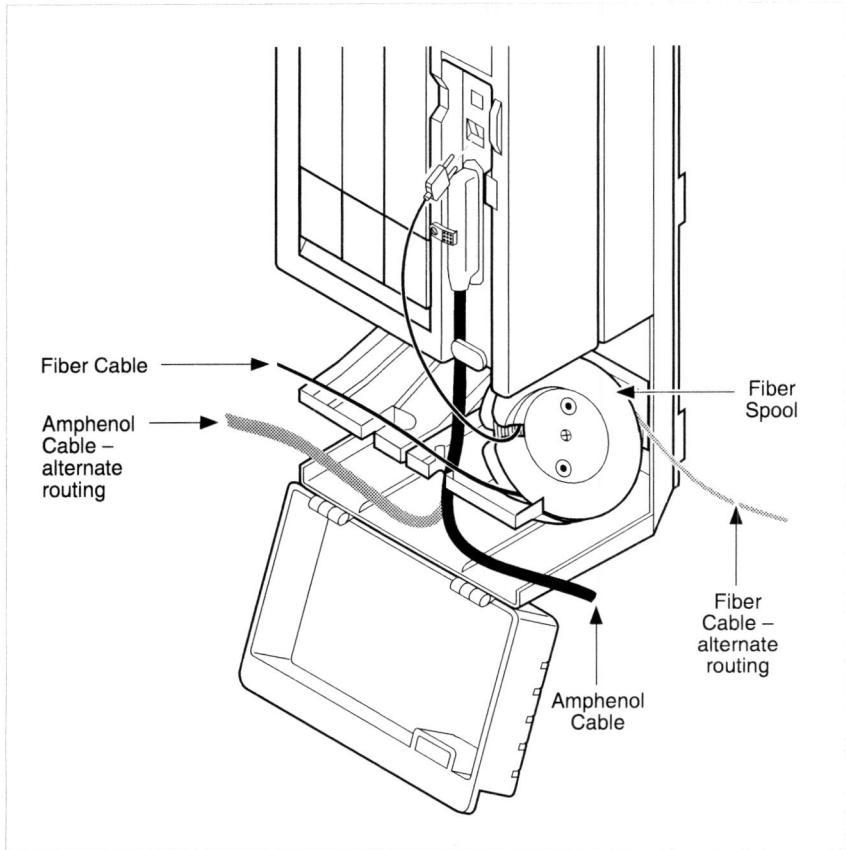
- ICS Door Label:** Located on the inside of the ICS door, it provides space to identify fiber port allocation on the ICS.



Fiber Cable Management System

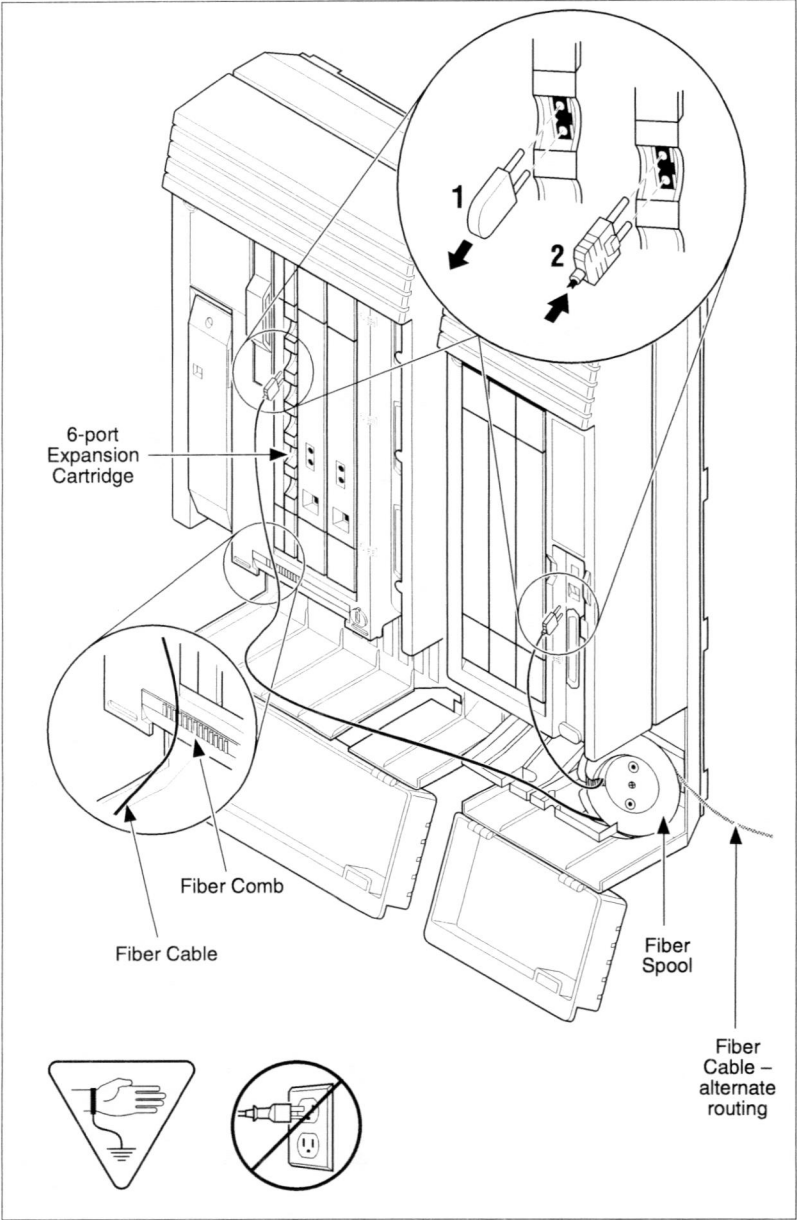


Using the Fiber Spool

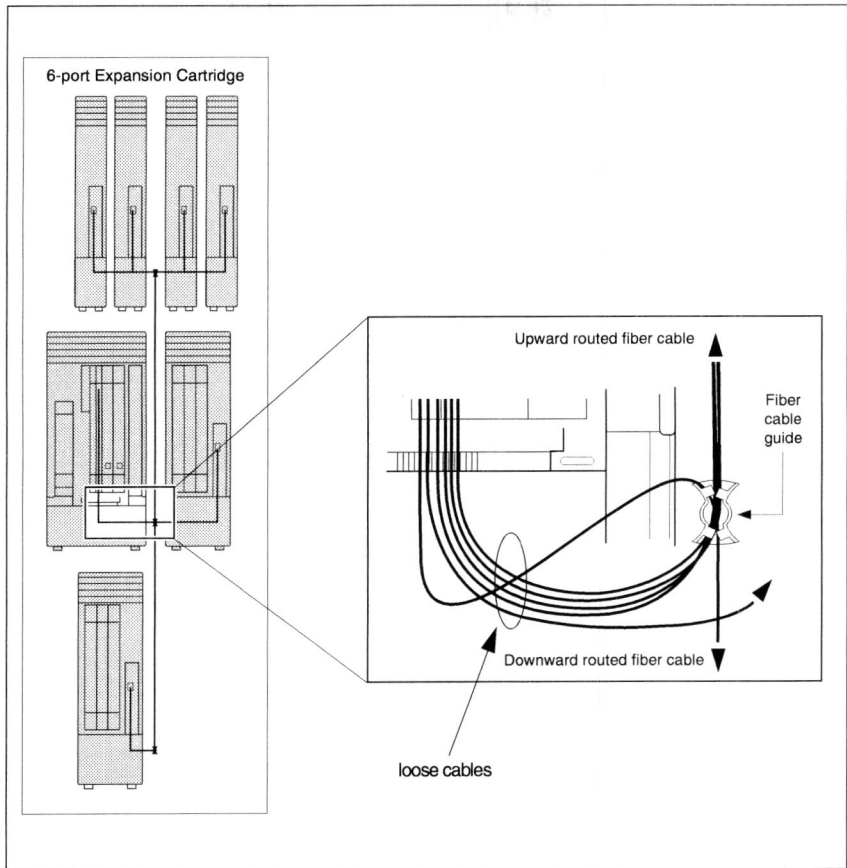


Making fiber connections

(XC 1.1 system is shown)

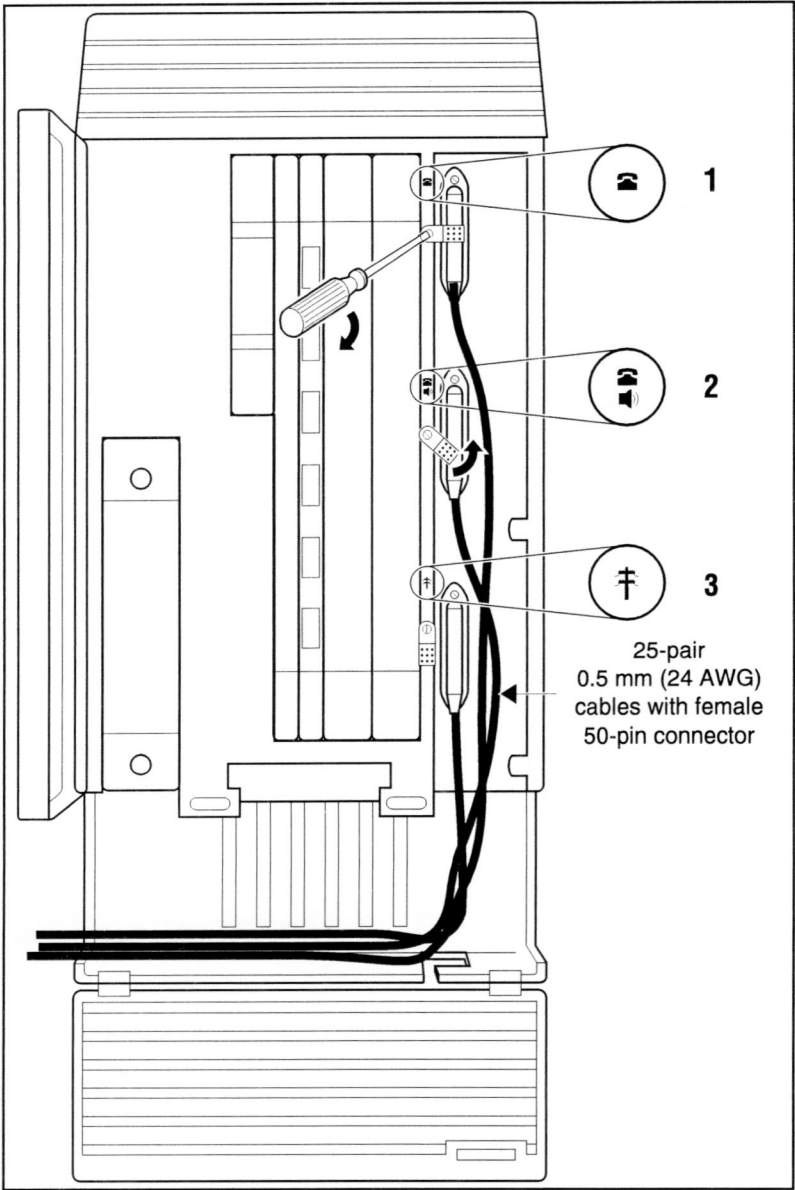


Routing fiber cables

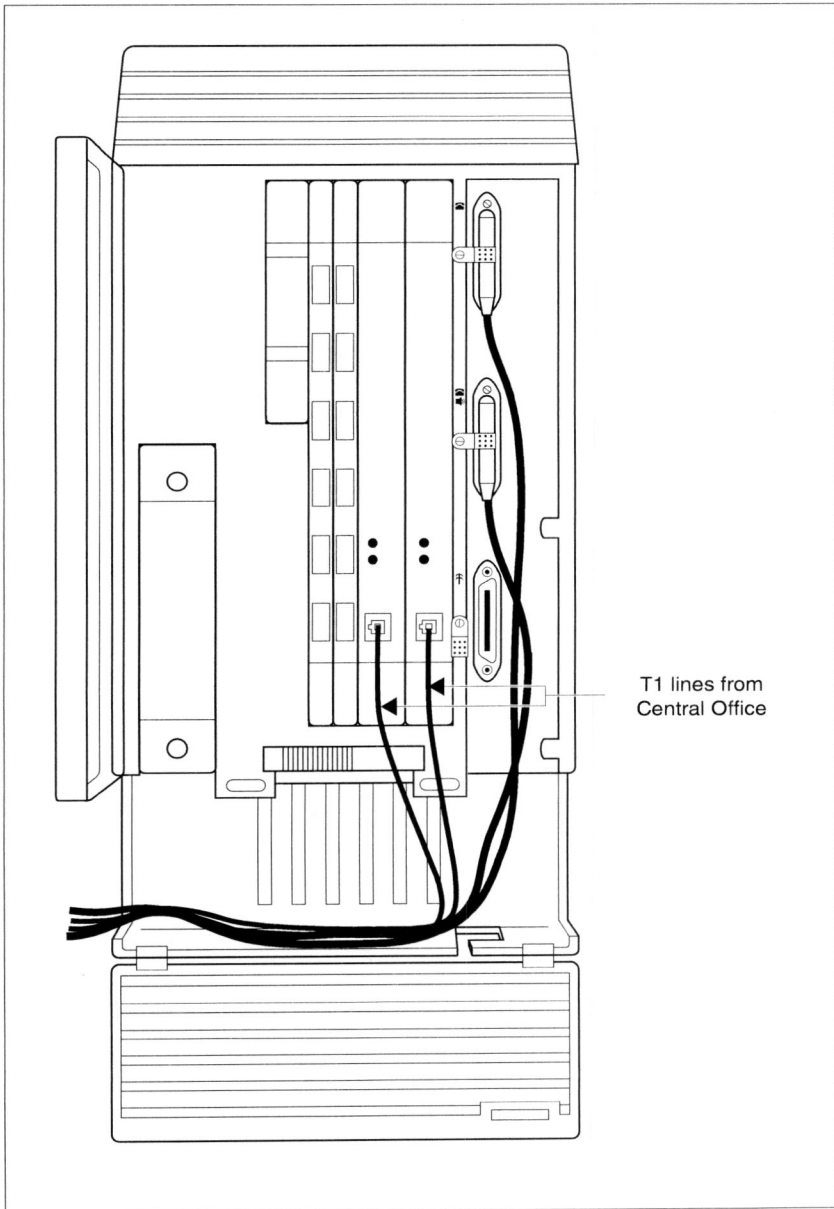


Connecting the wiring

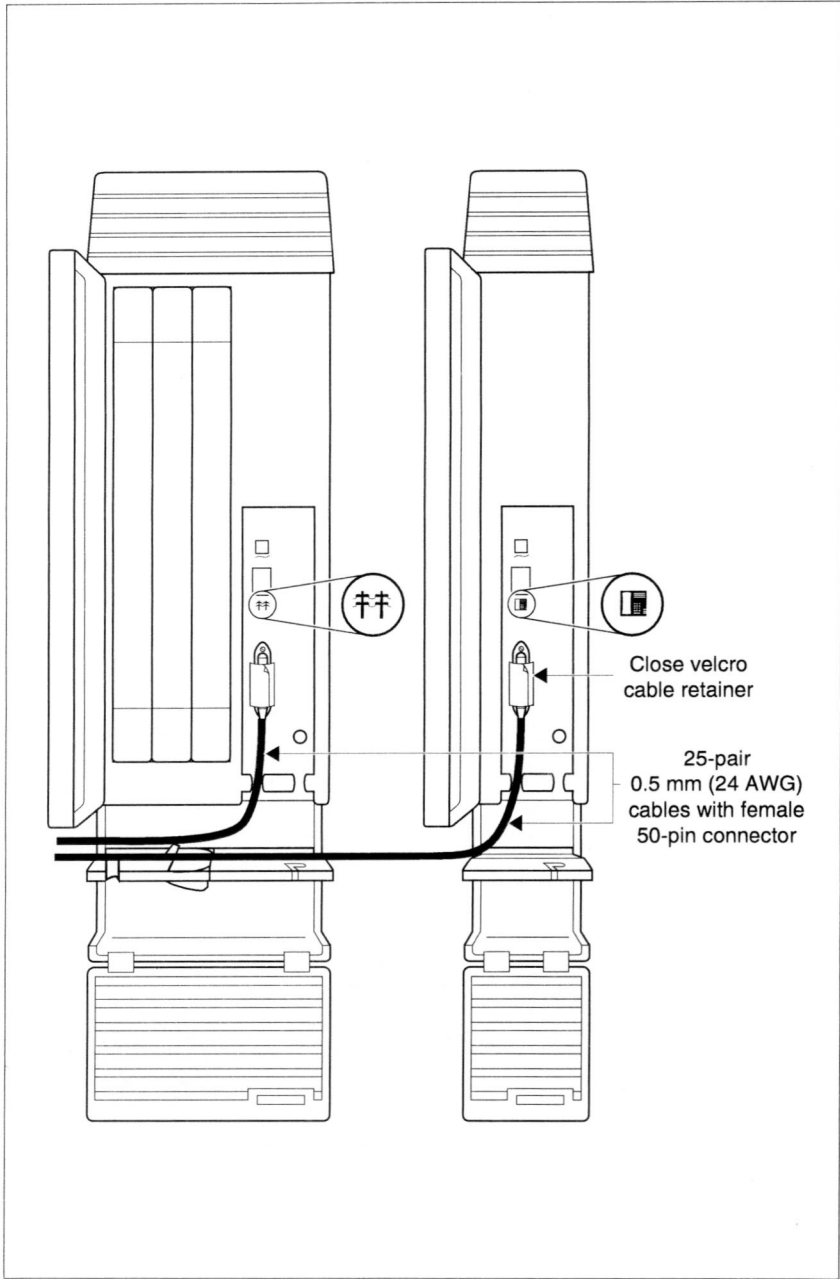
Connecting the wiring for an ICS with loop start lines



Connecting the wiring for an ICS with T1 lines (XC 1.1 system is shown)



Connecting the wiring from a Trunk Module and Station Module



Connecting the wiring to the distribution panel

1. Route the cables through the hole in the ICS cable trough to the distribution panel.
2. Bundle the cables with cable ties and secure them to the wall to support their weight.
3. Connect the telephone and auxiliary equipment wires to the appropriate pins on the distribution block (refer to the wiring charts).
4. Cross-connect the ICS telephone and auxiliary equipment wiring and the Station Module telephone wiring to the corresponding station pins on the distribution block.
5. Using a single pair of wires for each telephone, connect each of the telephones according to the wiring charts.
6. Cross-connect the external lines (loop start, E&M, DID) to the distribution block (refer to the wiring charts).
7. The DTI is equipped with an internal channel service unit (CSU). You can connect the DTI directly to the termination point provided by your T1 service provider. If you disable the internal CSU, you can connect the DTI to an external CSU or multiplexer.

The DTI does not provide the DC connection required for through-fed repeaters. If through-fed repeaters are used on the T1 span, disable the internal CSU and connect the DTI to an external CSU.

Wiring charts

Port numbering on the wiring charts

The port number listed on the wiring charts is useful in tracking down faults during a Maintenance session where error codes appear on a Norstar telephone display (see the Maintenance chapter).

The port numbers (for example: "XX12") on the Trunk Cartridge and Station Module wiring charts have two components:

- “XX” corresponds to the number that appears on the face of the Expansion Cartridge port that the Trunk Module or Station Module is connected to.
- digits (for example “01” or “12”) identify an individual port number associated with that Expansion Cartridge.

For example:

The code “812” appearing as part of an error message for a Trunk Module indicates that the problem is with Expansion Cartridge port #8 and internal port “12”. The corresponding Trunk Module pins on the distribution block are pin 47 (violet-orange) and pin 22 (orange-violet).

Integrated Communication System (ICS)

In the charts on the following pages, notice that the ICS has two internal modules, ICS #1 and ICS #2. ICS #1 handles telephones and auxiliary equipment. ICS #2 handles lines.

B1 and B2 directory numbers

The terms B1 and B2 correspond to channels on Norstar for transmitting voice and data. Each DN port number has a B1 DN and a B2 DN. Devices such as the Norstar M7100, M7208, M7310, and M7324 telephones use only the B1 DN. Other devices may need both B1 and B2 channels, therefore requiring B1 and B2 DNs.

Non-expanded system (ICS alone) numbering

Module #	Lines	Line ports	B1 DN	B2 DN	DN ports
ICS (#2)	001-048	201-248	— —	— —	— —
ICS (#1)	— —	— —	21-52	53-84	101-132

Two-port Expansion Cartridge and ICS numbering

Expansion module #	Lines	Line ports	B1 DN	B2 DN	DN ports
#4	049-060	401-412	269-284	333-348	401-416
#3	061-072	301-312	253-268	317-332	301-316
ICS (#2)	001-048	201-248	— —	— —	— —
ICS (#1)	— —	— —	221-252	285-316	101-132

Six-port Expansion Cartridge and ICS numbering

Expansion module #	Lines	Line ports	B1 DN	B2 DN	DN ports
#8	049-060	801-812	333-348	461-476	801-816
#7	061-072	701-712	317-332	445-460	701-716
#6	073-084	601-612	301-316	429-444	601-616
#5	085-096	501-512	285-300	413-428	501-516
#4	097-108	401-412	269-284	397-412	401-416
#3	109-120	301-312	253-268	381-396	301-316
ICS (#2)	001 -048	201-248	— —	— —	— —
ICS (#1)	— —	— —	221-252	349-380	101-132

Twelve-port expanded system and ICS numbering

Expansion module #	Lines	Line ports	B1 DN	B2 DN	DN ports
#14	— —	— —	— —	— —	— —
#13	— —	— —	— —	— —	— —
#12	— —	— —	397-412	589-604	1201-1216
#11	— —	— —	381-396	573-588	1101-1116
#10	— —	— —	365-380	557-572	1001-1016
#9	— —	— —	349-364	541-556	901-916
#8	049-060	801-812	333-348	525-540	801-816
#7	061-072	701-712	317-332	509-524	701-716
#6	073-084	601-612	301-316	493-508	601-616
#5	085-096	501-512	285-300	447-492	501-516
#4	097-108	401-412	269-284	461-476	401-416
#3	109-120	301-312	253-268	455-460	301-316
ICS (#2)	001 -048	201-248	— —	— —	— —
ICS (#1)	— —	— —	221-252	413-444	101-132

Tips

A 12-port expanded system is available on an XC 1.1 system.

Expansion module #13 and #14 are reserved for Companion Wireless capability. Refer to your *Norstar-Companion MICS-XC 1.1 Installer Guide* for information on using expansion module #13 and #14.

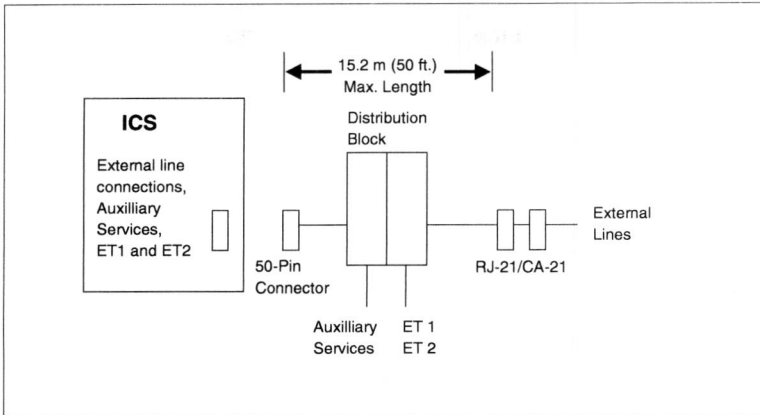
Port #3 is the bottom fiber cable port on both the two-port and the six-port Expansion Cartridge in slot 2. Port #9 is located on the left most expansion card in slot 1.

B1 and B2 directory numbers reflect the default numbering scheme.

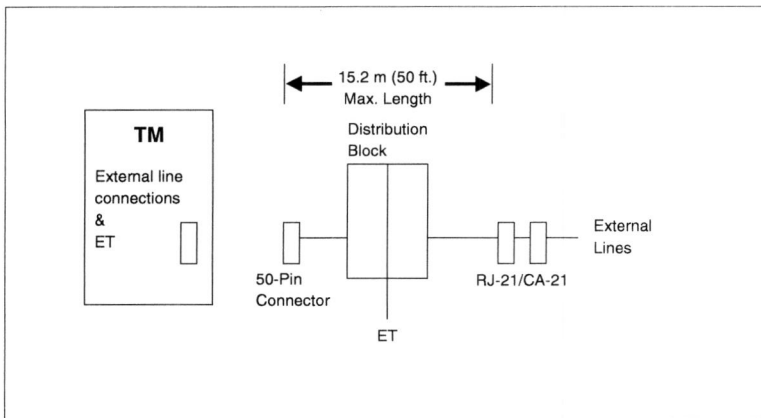
If you expand your system after initial installation and programming, there may appear to be gaps in your B1 DN numbering. This is because the system has already assigned DN numbers to B2 channels. You can correct these gaps by performing Startup programming and resetting the system memory, or by changing the individual DNs in *System Data* which is a part of Configuration programming.

	Startup programming erases the system memory
---	--

Wiring arrangement for Norstar ICS



Wiring arrangement for Norstar TM



ICS telephone wiring chart

Pin	Wire color	Port	Service	Telephones (ICS)	Default DN
26	White-Blue	101	T	1	
1	Blue-White	101	R	1	21/221/2221
27	White-Orange	102	T	2	
2	Orange-White	102	R	2	22/222/2222
28	White-Green	103	T	3	
3	Green-White	103	R	3	23/223/2223
29	White-Brown	104	T	4	
4	Brown-White	104	R	4	24/224/2224
30	White-Slate	105	T	5	
5	Slate-White	105	R	5	25/225/2225
31	Red-Blue	106	T	6	
6	Blue-Red	106	R	6	26/226/2226
32	Red-Orange	107	T	7	
7	Orange-Red	107	R	7	27/227/2227
33	Red-Green	108	T	8	
8	Green-Red	108	R	8	28/228/2228
34	Red-Brown	109	T	9	
9	Brown-Red	109	R	9	29/229/2229
35	Red-Slate	110	T	10	
10	Slate-Red	110	R	10	30/230/2230
36	Black-Blue	111	T	11	
11	Blue-Black	111	R	11	31/231/2231
37	Black-Orange	112	T	12	
12	Orange-Black	112	R	12	32/232/2232
38	Black-Green	113	T	13	
13	Green-Black	113	R	13	33/233/2233
39	Black-Brown	114	T	14	
14	Brown-Black	114	R	14	34/234/2234
40	Black-Slate	115	T	15	
15	Slate-Black	115	R	15	35/235/2235
41	Yellow-Blue	116	T	16	
16	Blue-Yellow	116	R	16	36/236/2236
42	Yellow-Orange	117	T	17	
17	Orange-Yellow	117	R	17	37/237/2237
43	Yellow-Green	118	T	18	
18	Green-Yellow	118	R	18	38/238/2238
44	Yellow-Brown	119	T	19	
19	Brown-Yellow	119	R	19	39/239/2239
45	Yellow-Slate	120	T	20	
20	Slate-Yellow	120	R	20	40/240/2240
46	Violet-Blue	121	T	21	
21	Blue-Violet	121	R	21	41/241/2241
47	Violet-Orange	122	T	22	

22	Orange-Violet	122	R	22	42/242/2242
48	Violet-Green	123	T	23	
23	Green-Violet	123	R	23	43/243/2243
49	Violet-Brown	124	T	24	
24	Brown-Violet	124	R	24	44/244/2244
50	Violet-Slate	----	----	no connection	----
25	Slate-Violet	----	----	no connection	----

T and R represent station connections and should not be confused with Tip and Ring on external lines. Station connections are non-polarized.

ICS telephone and auxiliary equipment wiring chart

Pin	Wire color	Port	Service	Telephones (ICS)	Default DN
26	White-Blue	125	T	25	
1	Blue-White	125	R	25	45/245/2245
27	White-Orange	126	T	26	
2	Orange-White	126	R	26	46/246/2246
28	White-Green	127	T	27	
3	Green-White	127	R	27	47/247/2247
29	White-Brown	128	T	28	
4	Brown-White	128	R	28	48/248/2248
30	White-Slate	129	T	29	
5	Slate-White	129	R	29	49/249/2249
31	Red-Blue	130	T	30	
6	Blue-Red	130	R	30	50/250/2250
32	Red-Orange	131	T	31	
7	Orange-Red	131	R	31	51/251/2251
33	Red-Green	132	T	32	
8	Green-Red	132	R	32	52/252/2252
34	Red-Brown	----	----	no connection	
9	Brown-Red	----	----	no connection	
35	Red-Slate	----	----	no connection	
10	Slate-Red	----	----	no connection	
36	Black-Blue	----	----	no connection	
11	Blue-Black	----	----	no connection	
37	Black-Orange	----	----	no connection	
12	Orange-Black	----	----	no connection	
38	Black-Green	----	----	no connection	
13	Green-Black	----	----	no connection	
39	Black-Brown	----	----	no connection	
14	Brown-Black	----	----	no connection	
40	Black-Slate	----	T	Page	
15	Slate-Black	----	R	Page	
41	Yellow-Blue	----	Make	External page	
16	Blue-Yellow	----	Common	External page	

42	Yellow-Orange	----	T	Music
17	Orange-Yellow	----	R	Music
43	Yellow-Green	----	----	reserved
18	Green-Yellow	----	----	reserved
44	Yellow-Brown	----	Make	Auxiliary ringer - 1
19	Brown-Yellow	----	Common	Auxiliary ringer - 1
45	Yellow-Slate	----	----	reserved
20	Slate-Yellow	----	----	reserved
46	Violet-Blue	----	----	no connection
21	Blue-Violet	----	----	no connection
47	Violet-Orange	----	----	reserved
22	Orange-Violet	----	----	reserved
48	Violet-Green	----	----	reserved
23	Green-Violet	----	----	reserved
49	Violet-Brown	----	----	reserved
24	Brown-Violet	----	----	reserved
50	Violet-Slate	----	----	reserved
25	Slate-Violet	----	----	reserved

T and R represent station connections and should not be confused with Tip and Ring on external lines. Station connections are non-polarized.

ICS external loop start lines wiring

ICS external lines connector

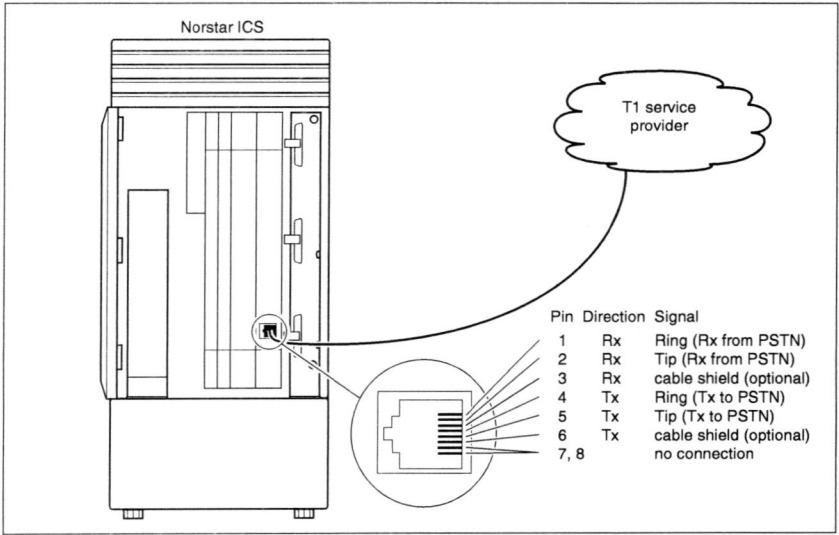
Pin	Wire color	Port	Service	Line
26	White-Blue	201	T	1
1	Blue-White	201	R	1
27	White-Orange	202	T	2
2	Orange-White	202	R	2
28	White-Green	----	----	----
3	Green-White	----	----	----
29	White-Brown	----	----	----
4	Brown-White	----	----	----
30	White-Slate	203	T	3
5	Slate-White	203	R	3
31	Red-Blue	204	T	4
6	Blue-Red	204	R	4
32	Red-Orange	----	----	----
7	Orange-Red	----	----	----
33	Red-Green	----	----	----
8	Green-Red	----	----	----
34	Red-Brown	225	T	25
9	Brown-Red	225	R	25
35	Red-Slate	226	T	26
10	Slate-Red	226	R	26
36	Black-Blue	----	----	----

11	Blue-Black	----	----	----
37	Black-Orange	----	----	----
12	Orange-Black	----	----	----
38	Black-Green	227	T	27
13	Green-Black	227	R	27
39	Black-Brown	228	T	28
14	Brown-Black	228	R	28
40	Black-Slate	----	----	----
15	Slate-Black	----	----	----
41	Yellow-Blue	----	----	----
16	Blue-Yellow	----	----	----
42	Yellow-Orange	----	----	----
17	Orange-Yellow	----	----	----
43	Yellow-Green	----	T	ET1
18	Green-Yellow	----	R	ET1
44	Yellow-Brown	----	T	ET2
19	Brown-Yellow	----	R	ET2
45	Yellow-Slate	----	----	----
20	Slate-Yellow	----	----	----
46	Violet-Blue	----	----	----
21	Blue-Violet	----	----	----
47	Violet-Orange	----	----	----
22	Orange-Violet	----	----	----
48	Violet-Green	----	----	----
23	Green-Violet	----	----	----
49	Violet-Brown	----	----	----
24	Brown-Violet	----	----	----
50	Violet-Slate	----	----	----
25	Slate-Violet	----	----	----

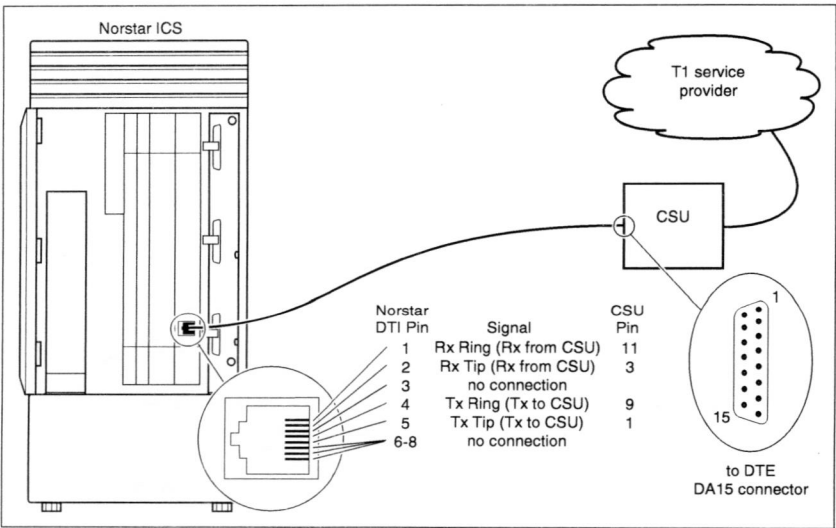
For an explanation of port numbering, see Port numbering on the wiring charts on page 79.

DTI wiring

Connecting the DTI to the T1 service provider



Connecting the DTI to an external CSU



Station Module wiring chart

Pin	Wire color	Port	Service	Telephones (SM)
26	White-Blue	X01	T	1
1	Blue-White	X01	R	1
27	White-Orange	X02	T	2
2	Orange-White	X02	R	2
28	White-Green	X03	T	3
3	Green-White	X03	R	3
29	White-Brown	X04	T	4
4	Brown-White	X04	R	4
30	White-Slate	X05	T	5
5	Slate-White	X05	R	5
31	Red-Blue	X06	T	6
6	Blue-Red	X06	R	6
32	Red-Orange	X07	T	7
7	Orange-Red	X07	R	7
33	Red-Green	X08	T	8
8	Green-Red	X08	R	8
34	Red-Brown	X09	T	9
9	Brown-Red	X09	R	9
35	Red-Slate	X10	T	10
10	Slate-Red	X10	R	10
36	Black-Blue	X11	T	11
11	Blue-Black	X11	R	11
37	Black-Orange	X12	T	12
12	Orange-Black	X12	R	12
38	Black-Green	X13	T	13
13	Green-Black	X13	R	13
39	Black-Brown	X14	T	14
14	Brown-Black	X14	R	14
40	Black-Slate	X15	T	15
15	Slate-Black	X15	R	15
41	Yellow-Blue	X16	T	16
16	Blue-Yellow	X16	R	16
42	Yellow-Orange	----	----	no connection
17	Orange-Yellow	----	----	no connection
43	Yellow-Green	----	----	no connection
18	Green-Yellow	----	----	no connection
44	Yellow-Brown	----	----	no connection
19	Brown-Yellow	----	----	no connection
45	Yellow-Slate	----	----	no connection
20	Slate-Yellow	----	----	no connection
46	Violet-Blue	----	----	no connection
21	Blue-Violet	----	----	no connection
47	Violet-Orange	----	----	no connection

22	Orange-Violet	----	----	no connection
48	Violet-Green	----	----	no connection
23	Green-Violet	----	----	no connection
49	Violet-Brown	----	----	no connection
24	Brown-Violet	----	----	no connection
50	Violet-Slate	----	----	no connection
25	Slate-Violet	----	----	no connection

T and R represent station connections and should not be confused with Tip and Ring on external lines. Station connections are non-polarized.

For an explanation of port numbering, see Port numbering on the wiring charts on page 79.

Loop Start or CI Trunk Cartridge wiring chart

TM 50-pin connector arrangement

TC Slot	Pin	Wire color	Port	Service	Line
Slot 1	26	White-Blue	X01	T	1
	1	Blue-White	X01	R	1
	27	White-Orange	X02	T	2
	2	Orange-White	X02	R	2
	28	White-Green	----	No connection	----
	3	Green-White	----	No connection	----
	29	White-Brown	----	No connection	----
	4	Brown-White	----	No connection	----
	30	White-Slate	X03	T	3
	5	Slate-White	X03	R	3
	31	Red-Blue	X04	T	4
	6	Blue-Red	X04	R	4
	32	Red-Orange	----	No connection	----
	7	Orange-Red	----	No connection	----
	33	Red-Green	----	No connection	----
	8	Green-Red	----	No connection	----
Slot 2	34	Red-Brown	X05	T	5
	9	Brown-Red	X05	R	5
	35	Red-Slate	X06	T	6
	10	Slate-Red	X06	R	6
	36	Black-Blue	----	No connection	----
	11	Blue-Black	----	No connection	----
	37	Black-Orange	----	No connection	----
	12	Orange-Black	----	No connection	----
	38	Black-Green	X07	T	7
	13	Green-Black	X07	R	7
	39	Black-Brown	X08	T	8
	14	Brown-Black	X08	R	8
	40	Black-Slate	----	No connection	----
	15	Slate-Black	----	No connection	----
	41	Yellow-Blue	----	No connection	----
	16	Blue-Yellow	----	No connection	----

Slot 3	42	Yellow-Orange	X09	T	9
	17	Orange-Yellow	X09	R	9
	43	Yellow-Green	X10	T	10
	18	Green-Yellow	X10	R	10
	44	Yellow-Brown	----	No connection	----
	19	Brown-Yellow	----	No connection	----
	45	Yellow-Slate	----	No connection	----
	20	Slate-Yellow	----	No connection	----
	46	Violet-Blue	X11	T	11
	21	Blue-Violet	X11	R	11
	47	Violet-Orange	X12	T	12
	22	Orange-Violet	X12	R	12
	48	Violet-Green	----	No connection	----
	23	Green-Violet	----	No connection	----
	49	Violet-Brown	----	No connection	----
	24	Brown-Violet	----	No connection	----
	50	Violet-Slate	----	reserved	----
	25	Slate-Violet	----	reserved	----

For an explanation of port numbering, see Port numbering on the wiring charts on page 79.

E&M/DISA Trunk Cartridge wiring chart

Use the chart that follows when a Trunk Module (TM) contains E&M/DISA Trunk Cartridges (TC).

Use the Trunk Module with E&M/DISA Trunk Cartridges table when a Trunk Module has only E&M/DISA Trunk Cartridges. It shows:

- the 50-pin connections on the TM

Read across the column headings to determine the cross-connections for E&M/DISA service.

If the Norstar system is being connected to another Norstar system or private branch exchange by connecting two RJ2HX/CA2HA distribution blocks together, use the following table to determine the required cross-connections.

Back-to-back cross-connections

1st distribution block	T	R	T1	R1	E	SG	M	SB
Next distribution block	T1	R1	T	R	SB	M	SG	E

Tips

When installing a mixture of E&M/DISA and DID or Loop Start Trunk Cartridges, it is important to cross-connect the wiring for each type of TC to a separate distribution block.

To verify the operation of the Norstar E&M cards and the target lines, wire the two E&M lines on the Norstar E&M back to back.

The cross-connections to each distribution block must always begin at pins 26 and 1. To retain emergency telephone function, install a Loop Start Trunk Cartridge in the left-most slot (slot 1) of the TM.

Trunk Module with E&M/DISA Trunk Cartridges

TM 50-pin connector arrangement

TC Slot	Pin	Wire color	Port	Service	Line
Slot 1	26	White-Blue	X01	T	1
	1	Blue-White	X01	R	1
	27	White-Orange	X01	T1	1
	2	Orange-White	X01	R1	1
	28	White-Green	X01	E	1
	3	Green-White	X01	SG	1
	29	White-Brown	X01	M	1
	4	Brown-White	X01	SB	1
	30	White-Slate	X02	T	2
	5	Slate-White	X02	R	2
	31	Red-Blue	X02	T1	2
	6	Blue-Red	X02	R1	2
	32	Red-Orange	X02	E	2
	7	Orange-Red	X02	SG	2
	33	Red-Green	X02	M	2
	8	Green-Red	X02	SB	2
Slot 2	34	Red-Brown	X03	T	3
	9	Brown-Red	X03	R	3
	35	Red-Slate	X03	T1	3
	10	Slate-Red	X03	R1	3
	36	Black-Blue	X03	E	3
	11	Blue-Black	X03	SG	3
	37	Black-Orange	X03	M	3
	12	Orange-Black	X03	SB	3
	38	Black-Green	X04	T	4
	13	Green-Black	X04	R	4
	39	Black-Brown	X04	T1	4
	14	Brown-Black	X04	R1	4
	40	Black-Slate	X04	E	4
	15	Slate-Black	X04	SG	4
	41	Yellow-Blue	X04	M	4
	16	Blue-Yellow	X04	SB	4
Slot 3	42	Yellow-Orange	X05	T	5
	17	Orange-Yellow	X05	R	5
	43	Yellow-Green	X05	T1	5
	18	Green-Yellow	X05	R1	5
	44	Yellow-Brown	X05	E	5
	19	Brown-Yellow	X05	SG	5
	45	Yellow-Slate	X05	M	5
	20	Slate-Yellow	X05	SB	5
	46	Violet-Blue	X06	T	6
	21	Blue-Violet	X06	R	6

47	Violet-Orange	X06	T1	6
22	Orange-Violet	X06	R1	6
48	Violet-Green	X06	E	6
23	Green-Violet	X06	SG	6
49	Violet-Brown	X06	M	6
24	Brown-Violet	X06	SB	6
50	Violet-Slate	----	reserved	----
25	Slate-Violet	----	reserved	----

For an explanation of port numbering, see Port numbering on the wiring charts on page 79.

DID Trunk Cartridge wiring chart

Use the chart that follows when a Trunk Module (TM) contains DID Trunk Cartridges.

Trunk Module with DID Trunk Cartridges

TM 50-pin connector arrangement

TC Slot	Pin	Wire color	Port	Service	Line
Slot 1	26	White-Blue	X01	T	1
	1	Blue-White	X01	R	1
	27	White-Orange	X02	T	2
	2	Orange-White	X02	R	2
	28	White-Green	----	No connection	----
	3	Green-White	----	No connection	----
	29	White-Brown	----	CCI NC1	----
	4	Brown-White	----	CCI Com1	----
	30	White-Slate	X03	T	3
	5	Slate-White	X03	R	3
	31	Red-Blue	X04	T	4
	6	Blue-Red	X04	R	4
	32	Red-Orange	----	No connection	----
	7	Orange-Red	----	No connection	----
	33	Red-Green	----	No connection	----
	8	Green-Red	----	No connection	----
Slot 2	34	Red-Brown	X05	T	5
	9	Brown-Red	X05	R	5
	35	Red-Slate	X06	T	6
	10	Slate-Red	X06	R	6
	36	Black-Blue	----	No connection	----
	11	Blue-Black	----	No connection	----
	37	Black-Orange	----	CCI NC1	----
	12	Orange-Black	----	CCI Com1	----
	38	Black-Green	X07	T	7
	13	Green-Black	X07	R	7
	39	Black-Brown	X08	T	8
	14	Brown-Black	X08	R	8
	40	Black-Slate	----	No connection	----
	15	Slate-Black	----	No connection	----
	41	Yellow-Blue	----	No connection	----
	16	Blue-Yellow	----	No connection	----
Slot 3	42	Yellow-Orange	X09	T	9
	17	Orange-Yellow	X09	R	9
	43	Yellow-Green	X10	T	10
	18	Green-Yellow	X10	R	10
	44	Yellow-Brown	----	No connection	----
	19	Brown-Yellow	----	No connection	----
	45	Yellow-Slate	----	CCI NC1	----

20	Slate-Yellow	----	CCI Com1	----
46	Violet-Blue	X11	T	11
21	Blue-Violet	X11	R	11
47	Violet-Orange	X12	T	12
22	Orange-Violet	X12	R	12
48	Violet-Green	----	No connection	----
23	Green-Violet	----	No connection	----
49	Violet-Brown	----	No connection	----
24	Brown-Violet	----	No connection	----
50	Violet-Slate	----	ET	----
25	Slate-Violet	----	ET	----

For an explanation of port numbering, see Port numbering on the wiring charts on page 79.

For CCI connections in Service column: NC1 stands for the normally closed relay and Com1 the common relay. CCI signaling is not supported by all carriers. For carriers or installations that do not use CCI signaling, the CCI and ET connections should be treated as "no connection".

CCI wiring is a non-standard wiring arrangement which has been submitted to the DOC.

DID supervisory signaling

This equipment is designed to return supervisory signals to the public switched telephone network (PSTN) when the DID calls are:

- answered by the called telephone
- answered by the attendant
- routed to a customer controlled recorded announcement
- routed to a dial prompt

This equipment is designed to return supervisory signals on all DID calls forwarded through the system back to the PSTN within 20 seconds of the call forwarding sequence being initiated.

Allowing this equipment to be operated in a manner that does not provide for proper answer supervision signaling violates FCC Part 68 Rules, and may violate local tariffs.

Emergency transfer conditions

Every DID Trunk Cartridge has a Control Circuit Interface (CCI) which should be connected directly to the central office for monitoring purposes.

If the Norstar system loses power or the microcontroller on the DID Trunk Cartridge malfunctions, the CCI signals the central office that it can no longer handle DID calls. The central office, by prearrangement, can then forward the DID lines to other numbers.

Connect the CCI com1 connection to a ground connection. Connect the CCI NC1 connection to the central office demarcation.

Tips

The CCI signaling to report power loss or malfunction of the DID Trunk Cartridge is not supported by all carriers. For carriers or installations which do not use CCI signaling, the CCI and ET connections should be treated as "no connection".

Wire each CCI independently to the central office. If the connections are wired in parallel, any CCI trouble disables all DID Trunk Cartridges. If the connections are wired in series, all DID Trunk Cartridges must fail before the central office recognizes the trouble condition.

Installing telephones

If you are installing Companion portable telephones, see the information included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Installing the emergency telephone

You can connect an emergency telephone to an ICS or Trunk Module with a Loop Start Trunk Cartridge, to provide emergency service when there is no power to the ICS. The ICS has emergency telephone connections for lines 002 and 026. Each Trunk Module has one emergency telephone connection.

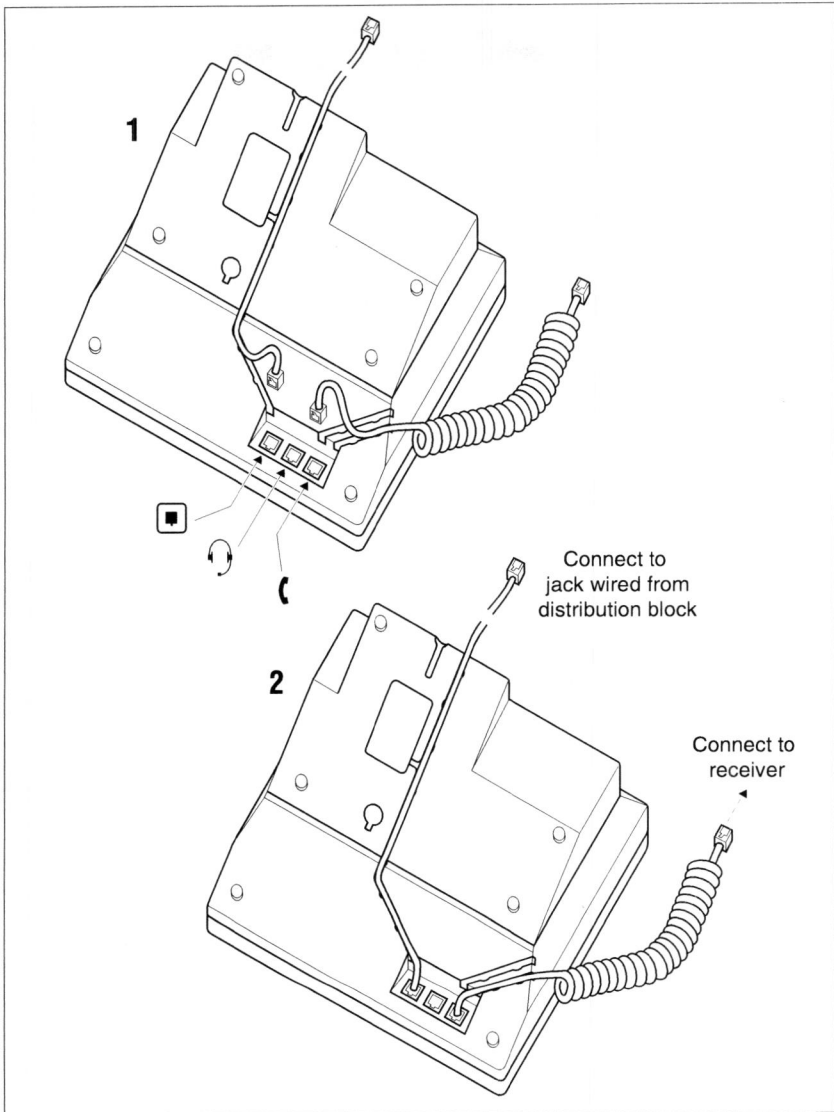
1. Wire a modular jack or equivalent to each set of emergency telephone pins on the 50-pin distribution block for the ICS or Trunk Module external lines. (See the wiring charts for the pin numbers.)
2. Connect a single-line telephone (500/2500) to the modular jack.
3. With the system power off, pick up the telephone receiver and listen for dial tone.

Tips

The emergency telephone connections on the Trunk Module will not work if there is an E&M/DISA or DID Trunk Cartridge in the first slot of the Trunk Module.

The emergency telephone connections on the ICS will not work if DTIs are used.

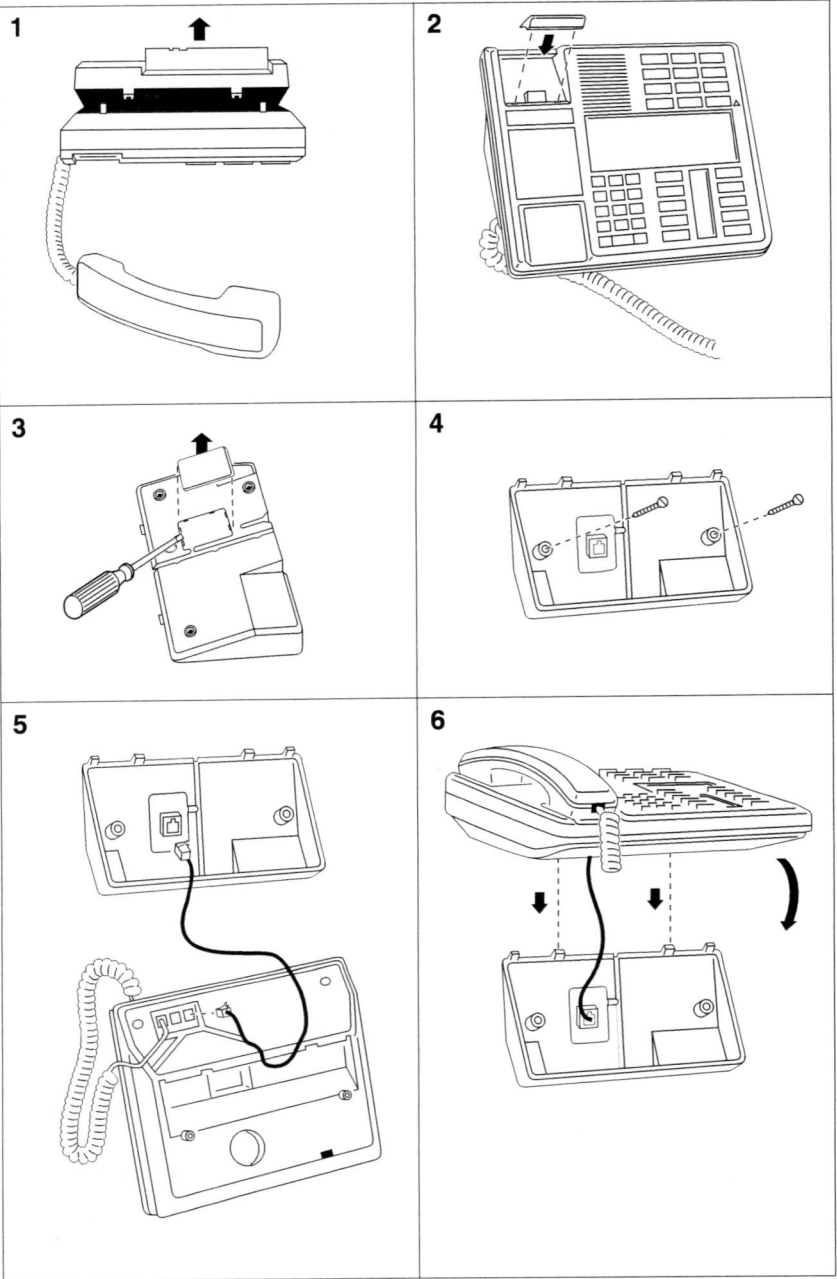
Installing Norstar telephones



Tips

Norstar telephones cannot be used as off-premise extensions (OPX). For OPX applications, use the Norstar Analog Terminal Adapter (ATA) and a single-line telephone. See the *Norstar ATA Installation Card* for details.

Mounting Norstar telephones on the wall



Moving Norstar telephones

You can move a Norstar telephone to a new location within the Norstar system without losing its programmed settings. When Set relocation (automatic telephone relocation) is enabled in Configuration programming, the internal numbers, autodial settings, and personal speed dial codes remain with the telephone when it is unplugged. To move a telephone, simply unplug it and plug it in again at another location. It may take up to 45 seconds for the ICS to recognize the telephone. Automatic Telephone Relocation is disabled by default.

Tips

All Norstar telephones being moved should be relocated before new telephones are plugged into their place. This allows the moved telephones to retain their programmed settings. If a new telephone is plugged into the Norstar system before the old telephone is reconnected at a new location, Norstar will give the old telephone's information to the new telephone, and the old telephone will no longer be recognized by the system.

When changing a telephone's internal number (in Configuration programming), wait one minute after Automatic Telephone Relocation.

When you relocate a Norstar telephone, the telephone must remain installed and connected in the new location for at least 3 minutes for the programming relocation to be complete. Moving the telephone again before the 3 minute period may result in losing the telephone's programming.

Installing optional equipment

Auxiliary ringer (customer supplied)

The Norstar ICS provides a control contact to operate an auxiliary ringer.

- 1. Follow the manufacturer's installation instructions.
- 2. Connect the auxiliary ring generator to the 50-pin distribution block as shown in the wiring charts.

The pins in this chart provide a control contact. They do not provide ring current or DC voltage. The ringer must not draw more than 50 mA from a 40 V DC source.

Auxiliary ringer programming

The auxiliary ringer can be activated by setting auxiliary ring for specific external lines, and auxiliary ring for specific telephones. Refer to the Programming chapter and the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for programming details.

Heading	Programmed in:
1. Trk/Line Data	Configuration
5. Capabilities	Administration
6. Service Modes	Administration

External music source (customer supplied)

The music source can be any approved low-power device such as a radio with a high-impedance earphone jack. The recommended ICS input level is 0.25 V rms across an input impedance of 3300 Ω.

- 1. Connect the music source output to the 50-pin distribution block, as shown in the wiring charts.
- 2. Adjust the volume of the music source to a comfortable level by activating Background Music (8 6) and adjusting the volume at the music source.

Tips

Background Music volume can also be adjusted at each telephone.

External music source programming

Music for callers on Hold and for Background Music must be enabled through programming. Refer to the Programming chapter for more details. Refer specifically to the following programming headings in Configuration and confirm that the following settings are implemented:

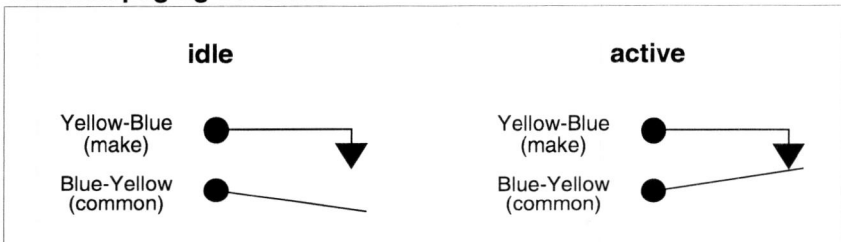
Heading	Setting
4. Call Handling	On hold: Music
5. Miscellaneous	Backgrnd music: Y

External paging system (customer supplied)

You can connect an external paging system to provide paging over external loudspeakers. The paging output from the Norstar ICS is 775 mV rms across an input impedance of 600 Ω .

1. Follow the manufacturer's installation instructions.
2. Connect the paging system audio input to the 50-pin distribution block as shown in the wiring charts.
3. Connect the paging system relay to the 50-pin distribution block as shown in the wiring charts.

External paging contacts



Tips

Norstar external paging does not support talk-back paging equipment unless an external line port is used.

The Norstar system provides paging over the Norstar telephone speakers, even when no external paging equipment is connected.

Powering up the system

1. Double-check all wiring before turning the system power on.
2. Route the TM and SM power cords through the lower shelf of the cable trough and out through the bottom of the ICS cable trough.
3. Route the ICS power cord through the bottom of the ICS cable trough.
4. Connect each power cord (ICS, TM and SM) to an electrical outlet (non-switchable, third-wire ground ac outlet).

If you are using a power bar, plug the power cords into the power bar and connect the power bar to the ac outlet.



Do not fasten power supply cords

To comply with UL1459, do not fasten the ICS power supply cord or Module power supply cords to any building surface, including the backboard.

5. Check that the power LEDs on the ICS, TM and SM are on.



Close and lock the ICS door

Close and lock the ICS door after installation is complete to avoid accidental shock and to provide containment in the event of fire.



Install Base Stations before powering up the XC 1.1 system

For information on installing Companion Wireless components, refer to your *Norstar-Companion MICS-XC 1.1 Installer Guide*.

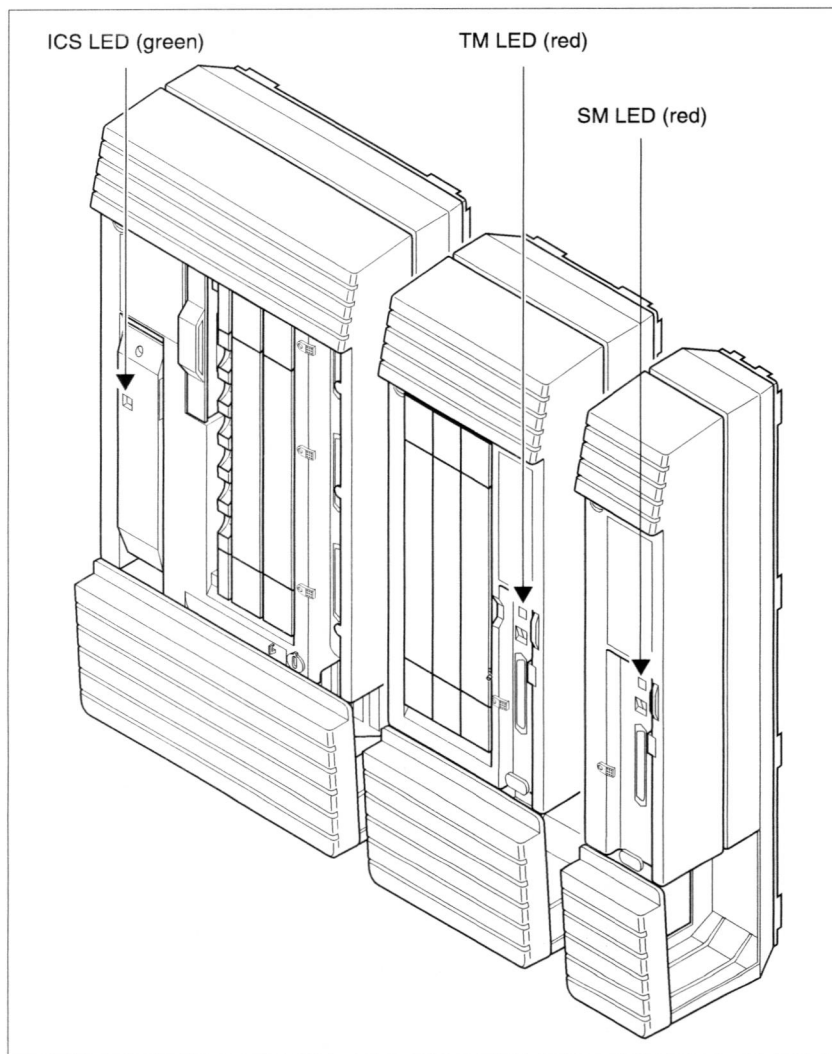
Tips

During system initialization, the system performs a self-diagnostic test on the hardware configuration size and expansion cartridge installation.

You can install the power bar in the lower shelf of the TM or SM cable trough and route the power cord out through the bottom of the ICS cable trough.

If you need more than one power bar, plug the second power bar into an outlet on the first power bar.

System Power Indicators



Once the system is initialized and the telephone displays read Jan 1 1:00 am, you have fifteen minutes in which to perform Startup programming. After 15 minutes, access to Startup programming is denied. You can turn the system power off and back on if you need to access Startup programming after this point.

Tips

After system startup, you can turn the power off and on and retain any system data that has been entered. This is considered a “warm” start (provided Startup programming is complete). A warm start takes approximately 5-10 minutes.



Call Log information may be lost

If the Norstar system suffers a power failure or the system is manually restarted, Call Log information is not saved. Notify users if a system restart is planned so any log information can be written down first.

Programming

Programming is performed by the installer or the customer service representative, and lets you change settings for the entire Norstar system, plus settings for individual telephones and external lines.



Programming affects system operation

Only a qualified installer or customer service representative should perform Startup, Configuration and Maintenance programming. Some of the settings affect the correct operation of the system.

This chapter contains information for programming Startup, Configuration and Maintenance settings. If you are new to programming, you may want to practice using the detailed Administration programming procedures in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* before attempting other procedures.

For information on Administration programming, and personal programming, see the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*.

Information on programming systems with Norstar Companion components is included in the *Norstar-Companion MICS-XC 1.1 Installer Guide* and *Norstar-Companion MICS-XC 1.1 System Coordinator Guide*.

Programming overview DR 1.1

Startup			
Template			
Start DN			
A. Configuration	B. General admin	C. Set copy	D. Maintenance
1. Trk/Line Data	1.Sys speed dial	Marcelo Papido	1.System Version
2. Line Access	2. Names	Narbone.	2.Port/DN Status
3. Routing	3. Time and Date	Fekhar Moura	3.Module Status
4. Call Handling	4. Direct-Dial	Marcelo Directo	4.Sys Test Log
5. Miscellaneous	5. Capabilities	Facultades.	5.Sys Admin Log
6. System Data	6. Service Modes	Tipos de Servicios	6.Network Log
	7. Passwords	Clave.	7.Clock Source
	8. Log Defaults	Valor impli. de reg.	8.Provisioning
	9. Call Services	Servicios de llamada	9.Loopback Tests
			10.CSU Stats

- 1.- Version Sistema
- 2.- Estado de puerta #
- 3.- Estado de modulo.
- 4.- Registro prueba sistema
- 5.- Reg. Admini Syste.

Programming overview XC 1.1

Startup			
Template			
Start DN			
A. Configuration	B. General admin	C. Set copy	D. Maintenance
1. Trk/Line Data	1.Sys speed dial		1.System Version
2. Line Access	2. Names		2.Port/DN Status
3. Routing	3. Time and Date		3.Module Status
4. Call Handling	4. Direct-Dial		4.Sys Test Log
5. Miscellaneous	5. Capabilities		5.Sys Admin Log
6. Radio Data	6. Service Modes		6.Network Log
7. System Data	7. Passwords		7.Clock Source
	8. Log Defaults		8.Provisioning
	9. Call Services		9.Loopback Tests
	10. Registration		10.CSU Stats

E. Software Codes	
1. SSN:	
2. Password Codes	
USA -MICS-XC 1.1 only	

Programming tools

A Norstar telephone

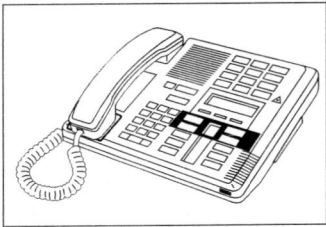
Programming is done at an M7310 or M7324 telephone. Use the buttons on the telephone to program a setting or to request a specific programming action. Norstar guides you step-by-step with instructions on the telephone display while you are programming.

The programming overlay

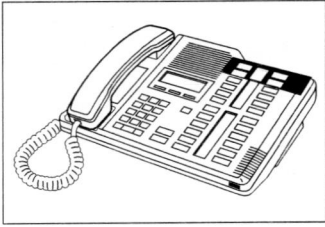
The programming overlay is a paper cutout that labels four telephone buttons used during programming. The programming overlay is provided at the end of this book.



M7310 telephone with a programming overlay



M7324 telephone with a programming overlay



The indicators on the M7310 or M7324 telephone show which buttons can be used at that programming step. The functions on these buttons allow you to move through the headings and subheadings of Norstar programming.

Heading

moves up in the hierarchy of headings and subheadings.

Show

moves down in the hierarchy of headings and subheadings, or begins programming for a heading or subheading.

Next

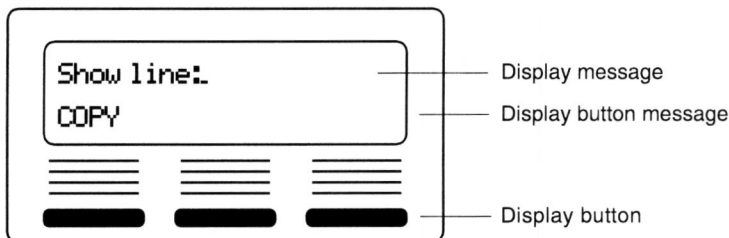
moves to the next heading, subheading, or setting.

Back

moves to the previous heading, subheading, or setting.

The Norstar display buttons

Display buttons on the M7310 and M7324 telephones perform many functions. Depending on where you are in programming, one, two, or three display buttons may be available at any one time. You press one of the display buttons to select the function that you want.



The most common display button labels are:

<u>CHANGE</u>	changes a programmable setting
<u>BKSP</u>	moves the cursor one space to the left (backspace) and deletes a character, allowing you to re-enter a number or letter
<u>COPY</u>	copies line or telephone programming
<u>VIEW→</u>	views the last part of a displayed message longer than 16 characters
<u>←VIEW</u>	views the first part of a displayed message longer than 16 characters
<u>--></u>	moves the cursor one position to the right when programming a name
<u><--</u>	moves the cursor one position to the left when programming a name

The Norstar Programming Record

The *Programming Record* provides a convenient way to record what you have programmed. It also helps you to plan your programming.

Pages from the record may be photocopied as necessary for programming many telephones or lines.

Exiting programming

Norstar stores your changes automatically as soon as you alter any settings; you do not need to “save” your changes.

1. Press **RLS**. The display briefly reads **End of session**.

Confirmation of changes to set data

When programming affects set data, such as using **System Data** or **C.Set Copy**, those Norstar sets which are busy during the programming session are not always updated immediately. Such a situation arises when someone is busy on a call during a programming session. The call must be dropped for the programming changes to take effect.

The Norstar system provides a confirmation that programming changes have taken effect for each set after exiting a programming session.

1. Once you have exited a programming session, provided set data has been changed, the display reads **Updating system**.
2. Press **SHOW**. The display shows the number of sets remaining to be updated (**Example: 034 to update**).
3. Press the display button **DN** to view those sets which have not been updated yet.
4. Press **NEXT** to scroll through the list of sets currently being updated.
5. Press **OK** to return to the first display message.
6. When the system is finished updating all sets, the display reads **Update Complete**. Press **OK** to return to the normal date and time display.

Entering numbers

Numbers are entered from the Norstar telephone dial pad. The backspace display button may be used to edit the number.

A line number must always be entered as a three-digit number. Line numbers from 10 to 99 must be entered with a leading zero (line 020, for example). Similarly, line numbers less than 10 must be entered with two leading zeros (line 002, for example).

Internal telephone numbers, also referred to as directory numbers (DNs), can be two to seven digits long on a non-expanded system, and three to seven digits long on an expanded system. The default DN length is two on a non-expanded system and three on an expanded system. The DN length can be changed in Configuration programming.

Viewing long telephone numbers

External telephone numbers can be up to 24 digits, but the telephone display is only 16 character spaces long. If you wish to see a previously programmed number that is longer than 16 digits, you must do the following:

Begin, for example, with 123456789012345.... The display shows only the first 15 digits. The three dots (...) at the end of the display indicate that more digits remain to the external number.

1. To see the remaining digits, press VIEW.
2. To see the first 15 digits again, press VIEW.

Using User Preferences programming

The User Preferences feature allows you to program memory buttons, speed dial codes and other settings for any Norstar telephone on the system.

For example, an employee may want to have the Do Not Disturb feature programmed onto a memory button or create a speed dial code. Instead of programming from the employee's telephone, you can program these features from any telephone.

Sub-headings in User Preferences

User preferences
Model
Button prgrming
User speed dial
Call log opt'ns
Dialing opt'ns
Language
Display cntrst
Ring type

To access User Preferences programming see instructions in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*.

The User Preferences feature is not available within Administration or Configuration programming.

Reviewing programmed settings

The Set Profile and Line Profile features help you to check your programming by allowing you to review the settings.

Programming that can be reviewed

Set Profile	Line Profile
Set name	Line name
Line Access	Trunk data
Set abilities	Line data
Set services	Line abilities
	Service Modes
	Call Info set
	Voice message center

Viewing the programming for a telephone

From an M7310 or M7324 telephone:

- 1. Press * * S E T . The display reads Show set:.
- 2. Enter the internal number of the telephone you wish to review.
- 3. Use BACK, NEXT, and SHOW to navigate through the settings.
- 4. Press to exit.

Viewing the programming for a line

From an M7310 or M7324 telephone:

1. Press . The display reads **Show line:.**
2. Enter the number of the line you wish to review.
3. Use BACK, NEXT, and SHOW to navigate through the settings.
4. Press to exit.

Template defaults

The five templates available in the Norstar DR 1.1 system are Square, Centrex, Hybrid, PBX and DID. For the XC 1.1 system, only the PBX and DID templates are available. The following charts show the default settings for each template.

Square defaults are listed in full. Centrex, Hybrid, PBX, and DID defaults are listed *only* when they differ from Square defaults.

When a DN is shown in this table, it is the three-digit DN that is the default on most expanded systems. (Two-digit DNs are the default on non-expanded systems.) If the DN length is originally configured to *more* than three digits, the DN length will be preserved after an upgrade.

For information on defaults for 6. Radio Data, 10. Registration, E. Software Codes, and the Registration password, refer to your *Norstar-Companion MICS-XC 1.1 Installer Guide*. These settings are used with XC 1.1 systems that use Companion components.

Startup defaults

Setting	Default
Norstar DR 1.1 template	Square
Norstar XC 1.1 template	PBX
Start DN	221 (may be different for upgraded systems)

Configuration defaults

Trunk Cartridge configuration (Trk/Line data)

Setting	Square	Centrex	Hybrid	PBX	DID
TCs on	ICS				
TCx on KSU	Loop				
TCx on TMx	Loop				
Discon timer	460 milliseconds				
Answer timer	2 seconds				
CO fail	TIA-547A				
Interface levels	ISDN Lvl				
Framng	ESF				
Internal CSU	ON				
CSU line bld	0 dB				
DSX1 bld	000-100 feet				
Line coding	B8ZS				

Trunk data (Trk/Line data)

Setting	Square	Centrex	Hybrid	PBX	DID
Line <xxx> (Trunk type)	Loop				
Trunk mode	Unsupervised				
Ans mode	Manual				
Ans with DISA	Yes				
Signal	WinkStart				
ANI Number	No				
DNIS Number	No				
Gain	Normal				
Dial mode	Pulse				
Full AutoHold	No				
LossPkg	MediumCO				
Rec'd #:	None			DN of the set it appears on	

Line data (physical and target lines)

Setting	Square	Centrex	Hybrid	PBX	DID
Line type	Public		Lines	Pool †	
			001 to 024:	Pool A	Lines 001 to 024: Pool A
			025 to 048:	Pool B	
			049 to 052:	Pool C	
			053 to 056:	Pool D	Lines 025 to 120: Public
			057 to 060:	Pool E	
			061 to 064:	Pool F	
			065 to 068:	Pool G	Lines 121 to 248: Public
			069 to 072:	Pool H	
			073 to 076:	Pool I	
			077 to 080:	Pool J	
			081 to 084:	Pool K	
			085 to 088:	Pool L	
			089 to 092:	Pool M	
			093 to 096:	Pool N	
			097 to 100:	Pool O	
			101 to 120:	Public	
			121 to 248:	Public	
Line grp	None				
Prime set	Set 221 (for each line)				
Aux. ringer	Yes (for each line)				
Auto privacy	Yes (for each line)				

† Target lines cannot be placed into line pools.

Line Access

Setting	Square	Centrex	Hybrid	PBX	DID
Line assignment	Lines 001 to 002: Appear & Ring All other external lines: Not assigned Lines 121 to 248: Not assigned	Line <nnn> † Appear & Ring	Set 221 Line 001: Appear & Ring All other sets: Line 001: Appear & Ring All other external lines: Not assigned Lines 121 to 248: Not assigned	All lines: Not assigned	All external lines: Not assigned Target lines: Appear & Ring
ILG assignment	All lines: Not assigned				
Answer DNs	Not assigned				
Line pool access	No				
Intercom keys	2				
Prime line	None	Line <nnn> †	Intercom		

† <nnn> is a three-digit line number. The Centrex template sequentially assigns lines to DNs. It assigns Line 001 to DN 221, Line 002 to DN 222, and so on, until all lines are assigned to DNs. The lines automatically become prime lines for the DNs.

Routing

Setting	Square	Centrex	Hybrid	PBX	DID
Route number	no defaults assigned				
Use	Pool A				
DialOut	no defaults assigned				
DestCode	no defaults assigned				
Normal route	999 (normal mode only)				
Digit absorption (max. two modes)	All				

Call Handling

Setting	Square	Centrex	Hybrid	PBX	DID
Held reminder	No				
Remind delay (presented if Held reminder is changed to Yes)	60 seconds				
DRT to prime	Yes				
DRT delay	3 rings				
Transfr callbk	3 rings				
Park prefix	1				
Park timeout	45 seconds				
Park mode	Lowest				
Camp timeout	45 seconds				
Directd pickup	Yes				
On hold	Tones				
Page tone	Yes				
PageTimeout	2700 seconds (45 min.)				

Miscellaneous

Setting	Square	Centrex	Hybrid	PBX	DID
Backgrnd music	No				
Direct-dial #	0				
DISA DN	None				
Auto DN	None				
Alarm set	Set 221				
CAP assignment	None				
Link time	600 milliseconds				
Set relocation	No				
Host delay	1000 milliseconds				
Receiver volume	Use systm volume				
External code					
Line pool codes	None		9 for Pool A None for Pools B to O		
Installer paswd.	C O N F I G		OR 2 6 6 3 4 4		
Daylight time	Yes				

Radio Data (see your *Norstar-Companion MICS-XC 1.1 Installer Guide*)**System Data**

Setting	Square	Centrex	Hybrid	PBX	DID
Individual DNs	Individual DNs may be changed.				
DN length	2 (non-expanded system) 3 (expanded system)				
Rec'd # length	3 (expanded system)				

Please see Confirmation of changes to set data on page 114.

General Administration defaults

System speed dial

Setting	Square	Centrex	Hybrid	PBX	DID
Speed dial #	(no defaults assigned)				
Use	Prime line				
Display digits	Yes				
Name (presented if Display digits is changed to No)	Sys Spd Dial <#nn> <#nn> is a two-digit system speed dial code (#12, for example).				
Bypass restr'n	No				

Names

Setting	Square	Centrex	Hybrid	PBX	DID
Set names	DN (221, for example)				
Line names	Line number (Line 001, for example)				

Time and Date

Square	Centrex	Hybrid	PBX	DID
The default time and date is: 1:00 a.m., January 1st, 1996				1:00 a.m., January 1st

Direct-Dial

Setting	Square	Centrex	Hybrid	PBX	DID
D-Dial1	Intnl #: 221				
D-Dial2, D-Dial3 D-Dial4, D-Dial5	None				

Dialing filters (Capabilities)

Setting	Square	Centrex	Hybrid	PBX	DID
Filter 00	No restrictions (cannot be changed)				
Filter 01	0 1 1800 1555 1...555				
Restr'n 01					
Restr'n 02					
Except'ns					
Restr'n 03					
Except'ns	911				
Restr'n 04	911				
Restr'n 05	411				
	976				
Filter 02 to 99	No restrictions				

Remote access packages (Capabilities)

Setting	Square	Centrex	Hybrid	PBX	DID
Package 00	Prohibits access to line pools and remote Page. Cannot be changed.				
Package 01 - 15	No for Pools A to O				
Line pool access					
Remote page	No				

Set abilities (Capabilities)

Setting	Square	Centrex	Hybrid	PBX	DID
Set filter	Normal Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6	02 11 12 13 00 00 00			
Line/set filter	Normal and Modes 1 - 6 None				
Set lock	None				
Full handsfree	No				
Auto handsfree	No				
HF answerback	Yes				
Pickup group	No				
Paging	Yes				
Page zone	1				
Aux. ringer	No				
Direct-dial	Set1				
Forward on busy	None				
Forward no answr	None				
Forward delay	3 rings				
DND on busy	No				
Allow redirect	No				
Redirect ring	Yes				
Hotline	None				
Priority call	No				
ATA Ans timer	7 seconds				
MsgIndicate	None				
Allow last no	Yes				
Allow saved no	Yes				
Allow link	Yes				

Line abilities (Capabilities)

Setting	Square	Centrex	Hybrid	PBX	DID
Line filters	Normal	03			
	Mode 1	21			
	Mode 2	22			
	Mode 3	23			
	Mode 4	00			
	Mode 5	00			
	Mode 6	00			
Remote filters	Normal	04			
	Mode 1	31			
	Mode 2	32			
	Mode 3	33			
	Mode 4	00			
	Mode 5	00			
	Mode 6	00			
Remote pkg	00				

Class of Service (COS) passwords (Capabilities)

Setting	Square	Centrex	Hybrid	PBX	DID
COS passwords	None				
User fltr	Deflt †				
Line fltr	Deflt †				
Remote pkg	Deflt †				

† The Deflt setting means that no COS filter is programmed by default. Any filters programmed elsewhere to apply to the telephone, the line or the user's COS password are still in effect.

Service Modes

Setting	Square	Centrex	Hybrid	PBX	DID
Mode names	Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6	Night Evening Lunch Mode 4 Mode 5 Mode 6			
Mode times	Day Mode Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6	All days Start 23:00 17:00 12:00 00:00 00:00 00:00		Stop 07:00 23:00 13:00 00:00 00:00 00:00	
Control sets	All lines All sets	Set 221 Set 221			
Ringling service	Ringing groups: all groups include set 221 All modes Off Trunk answer Yes Extra-dial Set 221 For all lines Ring group 001 Aux. ringer Yes				
Restriction service	All modes	Off			
Routing service	All modes Overflow	Off No			

Passwords

Setting	Square	Centrex	Hybrid	PBX	DID
Admin password	A D M I N	OR	2 3 6 4 6		
Reg. password	R A D I O	OR	7 2 3 4 6		

Log Defaults

Setting	Square	Centrex	Hybrid	PBX	DID
Space/Log					

Call Services

Setting	Square	Centrex	Hybrid	PBX	DID	
Auto Call Info	None				1) Target lines default to set which has line's ringing appearance. 2) All other lines default to None.	
Set services	No				Default target line: Yes	
Autolog/Show VMsg					All other lines: No	
Logging set						
Show extl VMsg	No				Default target line: Yes All other lines: No	
Log space						
Log						0
Pool						300
Log passwr	None					
1stDisplay	Name					
VMsg center tel#s	Centers 1 - 5 No number stored					
VMsg tel#s lines	1 for all lines					

Registration (see the *Norstar-Companion MICS-XC 1.1 Installer Guide*)

Startup programming

After the hardware has been installed and powered up, use Startup to initialize the system, and select one of the two system templates that best suits your system.



Startup erases programming

Startup erases any existing programmed data, and resets the system to factory defaults.

Performing Startup

1. Enter the Startup access code from a Norstar M7310 or M7324 telephone dial pad, by pressing

Feature * * S T A R T U P which is the same as
Feature * * 7 8 2 7 8 8 7 .

To be accepted, the Startup code must be entered no later than 15 minutes after the Norstar system has been powered up. (If 15 minutes have elapsed since you powered up the system, turn system power off and on, to prepare for the Startup process.)

2. Enter the Installer password. The default is C O N F I G which is the same as 2 6 6 3 4 4 .

Tips

The Installer password shown is the default normally used for Startup. For a system which has already been programmed, the Installer password might have been changed in Configuration and recorded in the *Programming Record*.

Changing the default template

After entering the Startup access code and Installer password the display reads Reset memory?.

1. Press YES to select a default template. The display shows the current template.

2. Press CHANGE to choose the appropriate template.

**Changing template resets system programming**

If you change your system template, your Configuration and Administration programming will be reset.

Changing the starting DN number

You can change the starting number for your telephone directory numbers (DNs). This is helpful when your system is part of a network and you want to use a uniform series of directory numbers for all telephones in your network.

With the display showing the current template.

1. Press . The display shows the current start DN.
2. Press CHANGE.
3. Enter the new directory number you want as the starting DN and press OK. The display shows the new range of DN numbers.
4. Press to store the programming. The display reads **Template applied**. The indicators begin to flash after a few moments, then the display reads **Jan 1 1:00 am**.

Tips

All Configuration and Administration programming is retained for three days if the power fails or if the Norstar system is powered off. After three days without power, it may be necessary to perform Startup.

The length of the new DN can be from two to seven digits on a non-expanded system and from three to seven digits on an expanded system.

The length of the directory number that you enter sets the length for all directory numbers and target line received numbers in the system.

A DN length change, if required, should be the first programming change on a newly installed Norstar system.

If any future expansion is planned, the DN length should be set to three, even on non-expanded systems.

If you reduce the length of the directory numbers in *System Data* in Configuration programming, the starting DN number is reset to the default value (**221**).

If you increase the length of directory numbers in *System Data* in Configuration programming, each increase in length places the digit 2 in front of any existing DN. For example, if DN 3444 was increased to a length of 6, the new DN would be 223444.

If the new DNs clash with the direct-dial digit, park prefix, or line pool codes or destination codes, those numbers are overridden and set to None.

Do not disable or enable ports in Maintenance programming during the first two minutes after Startup programming.

Maintenance programming

If your system includes Digital Trunk Interfaces (DTI), you need to perform some Maintenance programming after Startup before you can use your T1 trunks.

1. Press * * which is the same as * * . The display reads **Password:**.
2. Enter the Installer password. The default password is **CONFIG** (266344). The display reads **A. Configuration**. Three triangular indicators ► appear on the vertical display between the rows of buttons.
3. Place the programming overlay over the buttons pointed to by the indicators ►.
4. Press until the display reads **D. Maintenance**.

Choosing the clock source for your DTIs

Systems with digital interfaces need to synchronize to the network in order to function. Synchronization is done in a hierarchical way, where each device/switch obtains the network clock from the device/switch above it in the synchronization hierarchy and passes the network clock to the device/switch below it in the synchronization hierarchy. The synchronization levels are referred to as strata.

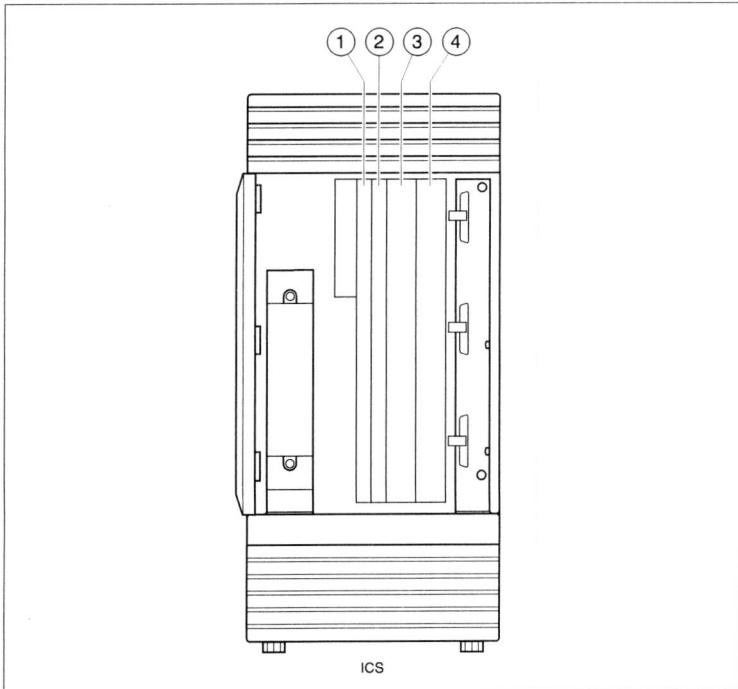
Norstar systems are stratum 4E equipment and are usually used as termination points in a network.

7. **Clock Source** lets you designate which of the systems DTIs obtains the timing reference from the network, which the system synchronizes to. For each DTI, choose one of the following settings:

Primary reference - the DTI obtains the timing reference from the network, which the system synchronizes to. This is the default value for the DTI in slot 4 in the ICS.

Secondary reference - the DTI acts as a standby reference. If there are excessive errors on the primary reference T1 link, or the DTI designated as primary reference fails, this DTI will obtain the timing reference from the network, which the system synchronizes to. This is the default value for the DTI in slot 3 in the ICS.

Timing master - the DTI does not obtain timing from the network, but transmits the systems timing to equipment connected to it.



Changing the clock source may restart system

Changing the clock source for your system may cause your system to restart itself. Do not change the clock source during normal business hours since calls may be dropped.

Begin with the display reading **D. Maintenance**.

1. Press .
2. Press until the display reads **7.Clock Source**.
3. Press . The display shows the clock source setting for the first DTI (slot 4).
4. Press **CHANGE** to toggle the setting.
5. Press to change the setting for the second DTI (slot 3).
6. Press to exit or to continue in Maintenance.

Tips

See Clock Source in the Maintenance chapter for more detail, and for some sample network/clock source configurations. In most T1 network configurations, you need one DTI in your ICS to act as a primary reference. If your Norstar system has two DTIs, you cannot assign both DTIs as primary reference or both DTIs as secondary reference. You can only have one primary reference and one secondary reference per system.

Provisioning your T1 lines

Although your DTI is capable of providing 24 T1 lines, not all 24 lines may be in service. You may have only leased a portion of the lines from your telephone company. You should provision the lines you have leased, and "deprovision" any lines not in use. The default value for a line is **provisioned**.

Begin with the display reading **D. Maintenance**.

1. Press .
2. Press until the display reads **8.Provisioning**.
3. Press . Enter the number of the T1 line you want to provision or deprovision. The display shows the current status of the line.
4. To provision a line, press **ADD**. To deprovision a line, press **REMOVE**.
5. Press to move to the next line.
6. Press to exit.

Configuration programming

After performing Startup, use Configuration programming to change default settings as required. Default settings for the PBX template are shown in bold.

Headings and subheadings in Configuration programming help you to keep track of where you are.

Configuration programming has the following headings:

XC 1.1

1. Trk/Line Data
2. Line Access
3. Routing
4. Call Handling
5. Miscellaneous
6. Radio Data
7. System Data

DR 1.1

1. Trk/Line Data
2. Line Access
3. Routing
4. Call Handling
5. Miscellaneous
6. System Data

Trunk/Line Data lets you assign settings to each trunk, external line and incoming target line.

Line Access lets you assign settings to each telephone.

Routing lets you create up to 500 destination codes and 999 routes to provide uniform dialing in a network, and least cost routing. Also, allows you to control the number of digits absorbed in a destination code sequence.

Call Handling lets you assign system-wide settings associated with various call features.

Miscellaneous lets you assign various system-wide settings.

Radio Data lets you view the cell assignments of Base Station radios and determine if a re-evaluation is necessary.

System Data lets you change a telephone's internal number, the length of all internal numbers, and the number of digits received for target lines, the DISA DN or the Auto DN.

For information about Configuration programming for a system which uses Companion components, see the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Entering Configuration

1. Press * * which is the same as * * . The display reads Password:.
2. Enter the Installer password. The default password is **CONFIG** (266344). The display reads R. Configuration. Three triangular indicators ► appear on the vertical display between the rows of buttons.
3. Place the programming overlay over the buttons pointed to by the indicators ►.

Trk/Line Data

1. Trk/Line Data

Cards on KSU

TC1 on KSU **Loop**

Lines **001-004**

Discon timer **460**

TC2 on KSU **Loop**

Lines **025-028**

Discon timer **460**

(if TC1 or TC2 on KSU=T1)

(if TC1 on KSU=T1)
Lines **001-024**

(if TC2 on KSU=T1)
Lines **025-048**

Discon timer **460**

Answer timer **2**

CO fail **TIA-547A**

Interface levels:
ISDN Lvl

Framng **ESF**

Internal CSU **ON**

(if Internal CSU=ON)
CSU line bld **0**

(if Internal CSU=OFF)
DSX1 bld **000-100**

Line coding **B8ZS**

(if TCs 1 to 3 on TMs 3 to 8)

TC1 on TM3 **Loop**

Lines **109-112**

(if TC on TM=Loop)
Discon timer **460**

(if TC on TM=E&M)
Answer timer **2**

Show line: _

Trunk data

Line001 **Loop**

(if TC on KSU=Loop or
TC on TM=Loop)

Trunk mode **Unspr**

(if Trunk mode=Super)
Ans mode **Manual**

(if Ans mode=Auto)
Ans with DISA **Y**

Dial mode **Pulse**

Full AutoHold **N**

LossPkg **MediumCO**

(if TC on KSU=T1 and
Line type=Loop)

Trunk mode **Super**

Ans mode **Manual**

(if Ans mode=Auto)
Ans with DISA **Y**

Dial mode **Pulse**

Full AutoHold **N**

(if TC on KSU=T1 and
Line type=E&M)

Ans mode **Manual**

(if Ans mode=Auto)
Ans with DISA **Y**

Signal **WinkStart**

(if Signal=WinkStart)
ANI Number **N**

(if Ans mode=Manual &
Signal=WinkStart)
DNIS Number **N**

Dial mode **Pulse**

(if TC on KSU=T1 and
Line type=DID)

Signal **WinkStart**

(if Signal=WinkStart)
ANI Number **N**

Dial mode **Pulse**

(if TC on KSU=T1 and
Line type=Ground)

Ans mode **Manual**

(if Ans mode=Auto)
Ans with DISA **Y**

Dial mode **Pulse**

Full AutoHold **N**

(if TC on TM=E&M)

Ans mode **Manual**

(if Ans mode=Auto)
Ans with DISA **Y**

Signal **WinkStart**

(if Signal=WinkStart or
Immediate)
ANI Number **N**

(if Ans mode=Manual &
Signal=WinkStart or
Immediate)
DNIS Number **N**

Gain **Normal**

Dial mode **Pulse**

(if TC on TM=DID)

Signal **WinkStart**

(if Signal=WinkStart or
Immediate)
ANI Number **N**

Dial mode **Pulse**

(if Target lines 121-312
(Mega); 121-248 (other))

Rec'd # **None**

Line data

Line type **Public**

Line grp **None**

Prime set **221**

Aux. ringer **Y**

Auto privacy **Y**

Trk/Line Data is broken into three main tasks or sections. The first task is to configure the Trunk Cartridges in the ICS and Trunk Modules. Trunk data lets you program settings for lines that affect how Norstar communicates with other switches. Line data lets you determine how a line will be used in the Norstar system.

Tips

Several of the settings in 1. Trk/Line Data cannot be changed unless you disable the affected Trunk Cartridges first.

For a new installation, there are two ways you can proceed:

1. Pre-program the Feature Cartridge on a system that has no Trunk Cartridges installed. This lets you freely change all the settings in 1. Trk/Line Data. Install your Trunk Cartridges once you have completed programming.
2. If you are programming a new system with Trunk Cartridges already installed, enter Maintenance and disable all the Trunk Cartridges using 3. Module Status before you begin 1. Trk/Line Data programming. When you complete 1. Trk/Line Data programming, re-enter Maintenance and enable all the Trunk Cartridges.

For an existing installation:

1. Enter Maintenance and disable the affected Trunk Cartridges before proceeding with 1. Trk/Line Data programming. Re-enable the cartridges once you have finished.

Copying Trunk and Line data

At the `Show line: . display` COPY appears. This allows you to copy programming from one line to other lines.

Tips

In copying data from a physical trunk to a target line (or the other way around), only the data in common is copied. For example, copying a target line to an E&M trunk copies only the Line data settings because there are no Trunk data settings for a target line.

If you try to copy line programming between lines on different types of Trunk Cartridges, the display reads `Incompatible TC`, then returns to `Show line: .` You cannot copy programming between lines on different types of Trunk Cartridges.

The Received number of a target line is a unique number and cannot be copied.

TCs on

The TCs on setting lets you specify the set of Trunk Cartridges you want to configure. Press CHANGE to select the setting: **KSU**, TM3, TM4, TM5, TM6, TM7, TM8.

Tips

Trunk Modules are numbered 3 to 8. The first Trunk Module connected to the six-port Expansion Cartridge (plugged into the top fiber connector) is TM8. The first Trunk Module connected to the two-port Expansion Cartridge (plugged into the top fiber connector) is TM4.

TC1 on KSU

The TC on KSU setting allows you to specify the type of Trunk Cartridges in the ICS. Press CHANGE to select the setting: **Loop** or T1.

Loop is the default setting used for Loop Start and Call Information (CI) Trunk Cartridges.

Select the T1 setting for DTIs.

Tips

You cannot change this setting unless you first disable the Trunk Cartridge using **3. Module Status** in Maintenance. Remember to enable the Trunk Cartridge once you have completed programming. See the Maintenance chapter for details.

The Trunk Cartridge slots in the ICS are numbered from right to left.

Lines 001-004

Once you specify the type of Trunk Cartridge in the ICS slot, press SHOW to display the line numbered range for the lines on the Trunk Cartridge.

	Line numbers for Loop start	Line numbers for T1
TC1 on KSU	001-004	001-024
TC2 on KSU	025-028	025-048

TC1 on TM3

The TC on TM setting allows you to specify the type of Trunk Cartridges in the Trunk Module. Press CHANGE to select the setting: **Loop**, E&M, or DID.

Loop is the default setting used for Loop start and Call Information (CI) Trunk Cartridges.

Tips

You cannot change this setting unless you first disable the Trunk Cartridge using **3. Module Status** in Maintenance. Remember to enable the Trunk Cartridge once you have completed programming. See the Maintenance chapter for details.

The Trunk Cartridge slots in the TM are numbered from left to right.

Trunk Modules are numbered 3 to 8. The first Trunk Module connected to the Expansion Cartridge (plugged into the top fiber connector) is TM8.

Lines 049-052

Once you specify the type of Trunk Cartridge in the ICS slot, press SHOW to display the line numbered range for the lines on the Trunk Cartridge.

TCs	Line numbers for six-port and 12-port Expansion Cartridge(s)	Line numbers for two-port Expansion Cartridge
KSU	001-048	001-048
TC1 on TM8	049-052	
TC2 on TM8	053-056	
TC3 on TM8	057-060	
TC1 on TM7	061-064	
TC2 on TM7	065-068	
TC3 on TM7	069-072	
TC1 on TM6	073-076	
TC2 on TM6	077-080	
TC3 on TM6	081-084	
TC1 on TM5	085-088	
TC2 on TM5	089-092	
TC3 on TM5	093-096	
TC1 on TM4	097-100	049-052
TC2 on TM4	101-104	053-056
TC3 on TM4	105-108	057-060
TC1 on TM3	109-112	061-064
TC2 on TM3	113-116	065-068
TC3 on TM3	117-120	069-072

Discon timer

Disconnect timer allows you to specify the duration of an Open Switch Interval (OSI) before a call on a supervised external line is considered disconnected. Press CHANGE to select the setting: 60, 100, 260, **460**, or 600 milliseconds.

Tips

Disconnect Supervision is assigned to each line with the Trunk mode setting in the Trunk data section of Configuration programming.

This setting must match the setting for the line at the central office.

This setting only appears for DTI and Loop Trunk Cartridges.

Answer timer

Answer timer allows you to set the minimum duration of an answer signal before a call is considered to be answered. Press CHANGE to select the setting: 1, **2**, 3, 4 or 5 seconds.

Tips

This setting only appears for DTI and E&M Trunk Cartridges.

CO fail

Select the carrier failure standard used by your T1 service provider. Press CHANGE to select the setting: **TIA-547A** or TR64211.

Tips

This setting only appears for DTIs. Consult your T1 service provider for the proper setting.

Interface levels

I/F levels defaults to the ISDN loss plan setting. Press CHANGE to select either setting: **ISDN** or PSTN interface levels.

Tips

Find out if your Norstar system is connected to a central office (CO) with digital network loss treatment (ISDN I/F levels) or analog network loss treatment (PSTN I/F levels) by checking with your telecommunications service provider.

The ISDN setting requires digital access lines (DAL) that have digital network loss treatment. On a DAL network, it is the PBX that administers the dB loss. DALs may have ISDN signalling or digital (such as T1 and so on) signalling. To have DAL network loss treatment on a line with digital signalling, you must contact your service provider.

The PSTN setting requires analog access lines (AAL) that have analog network loss treatment and digital signalling. On an AAL network, the CO administers the dB loss.

Both loss plans use a transmit objective loudness rating of -46 dB. The ISDN loss plan uses a receive objective loudness rating (ROLR) of 51dB and the PSTN loss plan uses a ROLR of 48dB.

Choosing the wrong setting may affect voice quality, either too loud or too soft.

Framing

Framing lets you select the framing format used by your T1 service provider. Press CHANGE to select the setting: **ESF** (Extended Superframe) or **SF** (Superframe).

Tips

This setting only appears for DTIs. Consult your T1 service provider for the proper setting.

You must disable the Trunk Cartridge using **3.Module Status** in Maintenance before you can change this setting. See the Maintenance chapter for details.

SF or Superframe is sometimes known as D4.

Internal CSU

Internal CSU allows you to turn the internal T1 channel service unit on or off. The channel service unit gathers performance statistics for your T1 lines. Press CHANGE to select the setting: **ON** or **OFF**.

Tips

This setting only appears for DTIs. Consult your service provider for the proper settings.

You must disable the Trunk Cartridge using **3.Module Status** in Maintenance before you can change this setting. See the Maintenance chapter for details.

You can view the performance statistics for your T1 lines in Maintenance under the heading **10.CSU Stats**.

If you set the internal CSU off, there must be an external CSU connected to your T1 lines.

CSU line bld

CSU line build allows you to set the gain level of the transmitted signal. Press CHANGE to select the setting: **0**, 7.5 or 15 dB.

Tips

This setting only appears for DTIs that have their internal CSU turned on.

You must disable the Trunk Cartridge using **3. Module Status** in Maintenance before you can change this setting. See the Maintenance chapter for details.

DSX1 bld

DSX1 build out allows you to set the distance between the ICS and an external channel service unit. Press CHANGE to select the setting: **000-100**, 100-200, 200-300, 300-400, 400-500, 500-600, 600-700 feet.

Tips

This setting only appears for DTIs that have their internal CSU turned off. Consult your service provider for proper settings.

You must disable the Trunk Cartridge using **3. Module Status** in Maintenance before you can change this setting. See the Maintenance chapter for details.

Line coding

Select the standard used by your T1 service provider for encoding signals on the T1 lines. Press CHANGE to select the setting: **B8ZS** or AMI.

Tips

This setting only appears for DTIs. Consult your T1 service provider for the proper setting.

You must disable the Trunk Cartridge using **3. Module Status** in Maintenance before you can change this setting. See the Maintenance chapter for details.



Enable Trunk Cartridges

If you have disabled any Trunk Cartridges to perform Configuration programming, enable them now using **3. Module Status** in Maintenance or your system will not function properly. See the Maintenance chapter for information on enabling Trunk Cartridges in Module Status.

Trunk data

Some Trunk Data settings may not appear on the display during programming depending on the type of trunk. Those that appear for a given Trunk type are indicated in the following table.

Trunk data settings that appear for a given trunk type

Setting	Loop start	E&M	DID	Target lines	Ground start
Line<nnn>:	√	√	√	—	√
Trunk mode	√	—	—	—	—
Ans mode	√	√	—	—	√
Ans with DISA	√	√	—	—	√
Signal	—	√	√	—	—
ANI Number	—	√	√	—	—
DNIS Number	—	√	—	—	—
Gain	—	√	—	—	—
Dial mode	√	√	√	—	√
Full AutoHold	√	—	—	—	—
LossPkg	√	—	—	—	√
Rec'd #	—	—	—	√	—

Line<nnn>

The Line setting shows the trunk type for a line. For lines connected to a DTI, press CHANGE to select the setting: **Loop**, E&M, DID or Ground.

- Loop is the setting used for loop start trunks.
- E&M is for the first two line numbers on E&M trunks.
- DID is for direct inward dialing (DID) trunks.
- Ground is for ground start trunks.

Tips

You can only change this setting for lines connected to a DTI. For all other lines, the trunk type is determined by the Trunk Cartridge type. The system simply displays the trunk type; you cannot change it.

E&M Trunk Cartridges have two E&M lines and two DTMF receivers (instead of four lines as in a Loop Start Trunk Cartridge). For example, if an E&M Trunk Cartridge has the range of line numbers 049 to 052, numbers 049 and 050 are E&M lines, and numbers 051 and 052 are the DTMF receivers. The display for line 050 appears as Line050:E&M and for line 051 appears as Line051:DTMF.

Changing the settings for trunk type (that is, Loop Start, E&M or DID) on a system that is in use, may cause calls to be dropped.

Trunk mode

Trunk mode lets you specify one of two modes of operation for each line: disconnect supervision or unsupervised. Disconnect supervision, also referred to as loop supervision, releases an external line when an open switch interval (OSI) is detected during a call on that line. This prevents the line from remaining unavailable for other Norstar users.

Press CHANGE to select the setting: **Unspr** or Super.

- Unspr (the default) turns disconnect supervision off for the line.
- Super assigns supervised mode, if supported by the line; otherwise, the line functions as unsupervised.

Tips

The Trunk mode setting is used only for lines on a Loop Start or CI Trunk Cartridge, and for loop start lines connected to a DTI.

The duration of an OSI before Norstar disconnects a call is programmed by the Discon timer setting of 1. Trk/Line Data programming.

Disconnect supervision is required for loop start trunks to operate in auto-answer mode or with DISA.

The line must be equipped with disconnect supervision from the central office for the Super option to work.

Ans mode

The Answer mode setting appears on the display during programming for loop start lines if the Trunk mode setting was Super, for ground start lines, and for E&M lines. Press CHANGE to select the setting: **Manual** or Auto.

Tips

If loop start lines are set to Auto, you will require an E&M card for the DTMF receivers to function properly.

Remember that disconnect supervision is required if loop start trunks are to operate in auto-answer mode.

You should change the Answer with DISA setting to N, for E&M trunks in a private network operating in auto-answer mode. The default, Y (Yes), causes the system to expect a Class of Service password after it automatically answers a trunk.

Ans with DISA

When activated, the Answer with DISA setting specifies that a trunk is answered with stutter dial tone. Press CHANGE to select the setting: **Y** (Yes) or **N** (No).

Tips

For loop start and E&M lines this setting only appears if Answer mode is Auto.

Set Ans with DISA to No for E&M lines on an enhanced switched network (ESN) to operate properly in auto-answer mode.

Signal

Select the signal type for the line. Press CHANGE to select the setting: **WinkStart**, **Immediate** and **DelayDial**.

Tips

The Signal setting appears on the display only for E&M or DID lines.

Make sure that this matches the signal type programmed for the trunk at the other switch.

For E&M and DID lines connected to a DTI, the Immediate setting does not appear if dial mode for the line is tone.

ANI Number

Select whether the telephone number of the caller will be collected for this line. The digits can then be displayed on Norstar telephones as part of Call Display services. Press CHANGE to select the setting: **N** (No) or **Y** (Yes).

Tips

The central office must deliver ANI/DNIS in DTMF mode. This setting applies only to E&M and DID lines.

The delivery of ANI/DNIS depends on the network provider and the services they offer.

For E&M or DID lines connected to a DTI, this setting only appears if Signal is WinkStart.

For lines connected to an E&M or DID Trunk Cartridge, this setting only appears if Signal is WinkStart or Immediate.

If the above conditions for signalling mode and start arrangement are not met, prompts are not presented to the user.

No additional equipment is required.

DNIS Number

Select whether the digits dialed by an external caller on this line will be collected. Press CHANGE to select the setting: **N** (No) or **Y** (Yes).

Tips

This setting applies to E&M lines only.

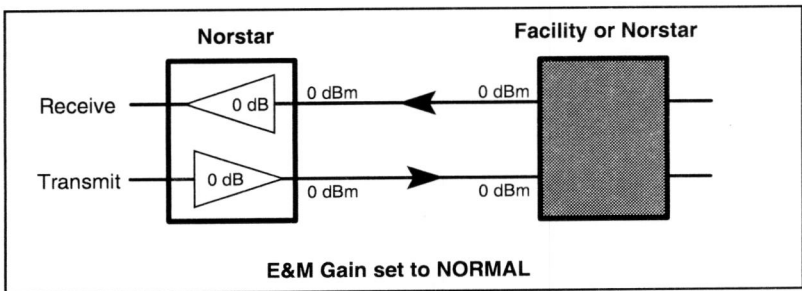
For E&M lines connected to a DTI, this setting only appears if Signal is WinkStart and Ans mode is Manual. For E&M lines connected to an E&M Trunk Cartridge, this setting only appears if Signal is WinkStart or Immediate and Ans mode is Manual.

These digits are required for some third party software applications.

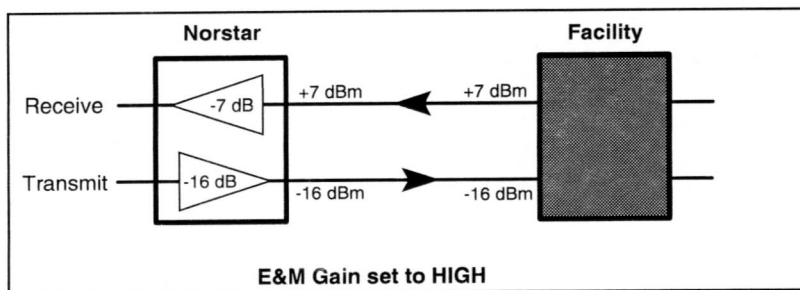
Gain

Select the appropriate gain level for the line. Press CHANGE to select the setting: **Normal** or **High**.

The default value **Normal** induces zero loss. Use it when the E&M trunks are connected to facilities that present 0 dBm at the interface, for both the transmit and receive paths.



The value **High** induces 7 dB of loss in the receive path and 16 dB of loss in the transmit path. Use it when the E&M trunks are connected to facilities that present +7 dBm in the receive path, and -16 dBm in the transmit path, at the interface.



Tips

Control over the gain (transmission levels) can only be set for lines on E&M Trunk Cartridges.

Dial mode

Dial mode lets you specify whether dual tone multifrequency (DTMF) or pulse signalling is used on the trunk. Press CHANGE to select the setting: **Pulse** or **Tone**.

Tips

For DID and E&M lines connected to a DTI, the Tone setting does not appear if Signal is Immediate.

Full AutoHold

Full AutoHold on idle line is a variation of the Automatic Hold feature. If you select an idle line, but do not dial any digits, that line is automatically placed on hold if you then select another line. Press CHANGE to select the setting: **N** (No) or **Y** (Yes).

The line you first selected is held until you press its button. The line is not available for use by anyone else.

Tips

The Full AutoHold setting appears only during loop start trunk programming. Full AutoHold is always in place for E&M trunks; it has no meaning for incoming-only DID trunks.

The default setting should be changed only if Full AutoHold is required for a specific application.

LossPkg

Loss Package lets you select the appropriate loss/gain and impedance settings for each line. The setting is based on the distance between the ICS and the terminating switch, and the terminating switch type. When measuring the distance from ICS to CO and from ICS to PBX, use 600 ohms as the termination resistance setting.

The following table shows the available settings.

LossPkg	Receiv eLoss	Transm it Loss	Impedance	Distance to switch/cable loss/ terminating switch
ShortCO	0 dB	3 dB	Short	Short/<2 dB/ICS to CO
MediumCO	0 dB	0 dB	TIA/EIA 464	Medium/>2 dB and <6 dB/ICS to CO
LongCO	-3 dB	0 dB	TIA/EIA 464	Long/>6 dB/ICS to CO
ShortPBX	0 dB	0 dB	Short	Short/<2 dB/ICS to PBX
LongPBX	-3 dB	0 dB	TIA/EIA 464	Long/>2 dB/ICS to PBX

A loss of 4 dB corresponds to a cable length of approximately 2700 m (9000 ft.).

Press CHANGE to select the setting: ShortCO, **MediumCO**, LongCO, ShortPBX or LongPBX.

Tips

This setting applies only to lines connected to an NT7B75GA-93 Loop Start Trunk Cartridge.

When measuring the distance from ICS to CO and ICS to PBX use 600 ohms as the termination resistance setting.

Rec'd

The Received number setting applies only to target lines (line numbers 121 to 248 for a DR 1.1 system and 121 to 312 for an XC 1.1 system). It allows you to specify the digits which make a specific target line ring. The default value is **None**.

Use CHANGE, and the dial pad to program the digit string for each target line.

Tips

A Received number can be two to seven digits long (programmed in *System Data*). The default length for a non-expanded system is 2. The default length for an expanded system is 3.

A received number cannot be the same as, or be the start digits of a line pool access code, a destination code, the DISA DN or the Auto DN.

Line data

Line data programming can be applied to all lines, trunks (001 - 120) and target lines:

- 121 to 248 on a mini, midi, or maxi DR 1.1 system
- 121 to 312 on a 12-port XC 1.1 expanded system

Line type

This setting specifies how the line is to be used in relation to other lines in the system. Press CHANGE to select the setting: Public, Private to:, or **Pool** (A to O, representing 15 line pools).

- A **Public** line can be accessed by more than one telephone.
- A **Private** line can be assigned only to one telephone and the prime telephone for that line. Use CHANGE and the dial pad to enter the internal number of the telephone.
- **Pool** assigns the line to one of the fifteen line pools. If a line is assigned to a line pool, but is not assigned to any telephone, that line is available only for outgoing calls.

Tips

Line pools must never contain a mixture of loop start lines and E&M lines.

All E&M lines in a given line pool should go to the same location.

Try to avoid putting unsupervised loopstart lines in a line pool. These lines can become hung, especially when a remote user uses the line pool to make an external call.

There are two more programming settings that must be assigned before a line pool can be used:

- You must assign line pool access to telephones in the 2. Line Access section of Configuration programming.
- You must assign system-wide line pool access codes in the Miscellaneous section of Configuration programming.

A telephone can be administered to search automatically for an idle line from several lines appearing on the telephone. Assign a line pool as the prime line (in 2. Line Access) and all the lines in the line pool must appear on that telephone. When the user lifts the receiver or presses , any one of the lines, if idle, can be selected by Automatic Outgoing Line selection.

When assigning lines to line pools, consider your network configuration. You may be able to create a unified dialing plan by assigning lines to the same location to the same line pool on each of your systems. For example, if system A and system B each have tie lines to system C, assign the tie lines to pool D on each of the systems.

If you plan to program the prime line as I/C (intercom) for some telephones, you may wish to assign loop start lines to the first line pool. Remember that when the system searches for an outgoing line, it begins at line pool A and chooses the first available line.

Assigning a single E&M trunk to a line pool allows features like Ring Again to help manage access to a shared resource.

You cannot assign target lines (121-248) to a line pool.

Line grp

Select whether this line will be part of an incoming line group. An incoming line group is a group of lines used only for receiving incoming calls. This allows a group of incoming lines to appear and/or ring at only one button on a telephone. Press CHANGE to select the setting: **None** or ILG (01 to 15, representing 15 incoming line groups).

Tips

Do not assign auto-answer loop start or E&M lines, or DID lines to an incoming line group.

Since the incoming line group button tracks up to two calls at once, only program two lines to each incoming line group button. If you require more than two lines to appear under an incoming line group button, use additional line groups programmed to that set.

For example, if you have 5 lines to program to an incoming line group, program the first two to ILG 01, and the next two to ILG 02 and the last one to ILG 03. Program ILG 01, 02, and 03 to the sets where these lines will ring.

There is a one ring delay for lines with an ILG appearance. For example, if line 002 in ILG 01 is programmed on set 222 with line 002 programmed to ring only, and set 223 to appear and ring, when a call comes in on line 002, set 223 will ring before set 222.

There is a two ring delay between the ringing the caller hears and the ringing of the ILG sets, however the LCD associated with the sets will flash immediately. You must consider this when setting up voice messaging. For example, if you program your voice messaging service to answer after 4 rings, it may answer after 4 rings but the Norstar user has heard 2 rings only.

For quicker response to a number of incoming lines from a group of sets, provide several intercom appearances on each set, and program the lines as ring only on those sets.

An incoming line group must be assigned to appear at a telephone.

Whether a line in an incoming line group rings at a telephone depends on the ringing setting for the line the call is on. If an incoming line group contains a mix of ringing and non-ringing lines, it will ring for some calls and not for others.

If you answer a call on an incoming line group, and a second call comes in on the same group, your telephone rings softly. However, you cannot answer the second call without ending the first.

You cannot make a call using an incoming line group.

Note the difference between incoming line groups and line pools. An incoming line group is a collection of lines used only for incoming calls. A line pool is a collection of lines used only for making outgoing calls. These groupings are for convenience in making and answering calls; they do not limit how the lines themselves can be used. A line may appear in a line pool, an incoming line group, and individually on telephones at the same time. However, you can not place a line in more than one incoming line group or line pool.

You can place a call in an incoming line group on hold and retrieve it in the normal way. However, a held ILG call cannot be picked up at any other telephone unless the line is assigned to appear at that telephone.

Prime set

This feature allows you to assign a telephone to provide backup answering for calls on the line. Unanswered calls are redirected to the prime telephone. Use CHANGE and the dial pad to enter the internal number of the prime telephone.

Tips

For auto-answer trunks, calls ring only at the prime telephone for a trunk, and only when overflow call routing is active.

Each line can be assigned only one prime telephone.

Aux. ringer

This setting allows you to turn the auxiliary ringer on or off. An auxiliary ringer can be programmed on a line or a set. When programmed on a set, the auxiliary ringer will ring every time a call is received. When programmed on a line, the auxiliary ringer will not ring when a transferred call is received.

Press CHANGE to select the setting: **Y** (Yes) and **N** (No).

Tips

The auxiliary ringer is an optional device that should be connected by the installer.

An auxiliary ringer can also be programmed in the Services Modes section of Administration programming to ring for a line placed into a Service mode. See the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for more information.

Auto privacy

This feature controls whether one Norstar user can select a line in use at another telephone to join an existing call. The default setting is Privacy on, so that nobody with a Norstar telephone can press a line appearance on their telephone to join a call in progress at another telephone. Press CHANGE to select the setting: **Y** (on) and **N** (off).

Tips

Users can change a line's privacy setting for an individual call using the Privacy feature ().

Line Access

Line Access allows you to assign lines to individual telephones. When you are finished programming Line Access settings for one telephone, you can copy those settings to other telephones.

2. Line Access	
Show set: _	
Line assignment	
Show line: _	
Line001	Appear&Ring
ILG assignment	
Show ILG: _	
LG01	Not assignd
Answer DN's	
Show set: _	
Not assignd	
Line pool access	
Line pool A	N
Intercom keys	2
Prime line	None

In some cases, Line Access programming for Norstar Companion portables works differently than it does for desk sets. See the *Norstar-Companion MICS-XC 1.1 Installer Guide* for information.

Line assignment

This setting allows you to assign physical trunks and target lines to each telephone. Target lines are assigned and removed in the same manner as other lines. Press and enter the line number. Press **CHANGE** to change the setting for each line: **Appear&Ring**, **Appear only**, **Not assignd**, or **Ring only**.

Tips

On a Norstar-PLUS MICS the maximum number of Norstar M7000 sets that can have the same line appearance is 50.

Press SCAN to view the lines assigned to this telephone.

In general, auto-answer loop start trunks, auto-answer E&M trunks and DID trunks are not assigned to telephones. If assigned, they are used for monitoring incoming call usage, or for making outgoing calls (auto-answer loop start and E&M trunks).

You cannot assign a line that is private to another telephone.

Each line assigned to appear at a telephone must appear at a button with an indicator on that telephone. The maximum number of line buttons are: 8 for the M7208 telephone; 10 for the M7310 telephone; 24 for the M7324 telephone.

If you set a line to Ring only, incoming calls appear on an intercom button.

A central answering position (CAP), with one or two CAP modules, can provide extra line buttons if more than 24 lines are assigned to the CAP. The remaining lines appear at buttons on the CAP module.

The M7100 telephone is an exception; it has no line buttons and can be assigned any number of lines.

Make sure that lines assigned to an M7100 telephone are assigned to ring; otherwise, you cannot detect incoming calls on the lines.

ILG assignment

The Incoming Line Group assignment setting lets you assign incoming line groups to individual telephones. Press enter the ILG number (01-15). Press CHANGE to change the setting: **Not assignd**, assigned.

Tips

Press SCAN to view the ILGs assigned to this telephone.

If you want incoming calls on a line in an incoming line group to ring at a telephone, assign the individual line to Ring only in Line assignment.

You cannot assign an incoming line group to a M7100 telephone or to a single line telephone attached to an Analog Terminal Adapter.

Answer DNs

Calls for other Norstar telephones can appear and be answered at the telephone being programmed. The DNs of the other telephones are referred to as Answer DNs.

Press and enter the Answer DN. Press CHANGE to change the setting for the Answer DN: **Appear&Ring**, Appear only, or Not assignd.

To assign additional Answer DNs, press , then enter the next Answer DN.

Tips

Press SCAN to view the Answer DNs assigned to this telephone.

Every Answer DN assigned to the telephone automatically assigns an Answer button with an indicator to the telephone. These buttons should be labeled accordingly, identifying the telephone with its name or DN.

The maximum number of Answer DNs that can be assigned to a particular Norstar set is four.

More than one telephone can have an Answer button for the same DN. In this way, more than one telephone can provide call alerting and call answering for any calls directed to that DN.

When a call to a Norstar set is received via Call Forwarding, the Answer DN for that set will not alert.

Line pool access

This setting allows a telephone to access one or more of the fifteen line pools available (A to O). When you assign "yes" for a given line pool, the telephone being programmed can access any lines in that line pool.

Press and to display the line pool you want to program access to. Press CHANGE to select the setting: **N** (No) and **Y** (Yes).

Intercom keys

This setting assigns the number of intercom buttons to a telephone. Intercom buttons provide a telephone with access to internal lines and line pools. Press CHANGE to select the setting: 0, 1, **2**, 3, 4, 5, 6, 7, or 8.

Tips

Each intercom button assigned during programming automatically appears on the telephone. The buttons start with the lower right-hand button, or one button above if the Handsfree/Mute feature is assigned to the telephone.

A telephone needs two intercom buttons to be able to establish a conference call with two other Norstar telephones.

Only one intercom button may be required if the button will only be used to make and receive internal calls, and to access line pools.

Two intercom buttons are required if a telephone has several lines assigned to ring only.

The M7100 telephone default assignment of two Intercom buttons cannot be changed. These buttons do not appear on the telephone.

Prime line

This setting assigns a prime line to the telephone. A prime line is the first line that is automatically selected when a call is made from a Norstar telephone. Press CHANGE to select the setting: **None**, a line number, Pool (A to O), and I/C (intercom). (Only assigned lines and line pools appear.)

Tips

An assigned prime line is not associated with the assignment of a prime telephone.

An external line must be assigned to the telephone in Line assignment before it can be assigned as the prime line to the telephone.

A line pool must be assigned to the telephone in line pool access before a line pool can be assigned as the prime line to the telephone.

A target line cannot be a prime line for a telephone because it is incoming-only.

A DID line should not be assigned as the prime line for a telephone. If assigned, it is treated as if no prime line has been assigned. The message *Select a line* appears when the receiver is lifted.

Remember that if you set prime line to I/C (intercom), you may wish to assign loop start lines to the first line pools. Remember that when the system searches for an outgoing line, it begins at line pool A and chooses the first available line.

By assigning a line pool as a prime line, a telephone can be made to search automatically for an idle line in a pool. This is described in the section on programming Line type (1. Trk/Line Data).

Routing

The programming for routing decides what path an outgoing call takes using the digits that are dialed. It is sometimes called Automatic Route Selection (ARS).

When you select an internal line and dial, the numbers you enter are checked against the routing tables. If the number you dialed starts with a destination code, the system uses the line pool and dials out digits specified by the route assigned to that destination code, and then dials the rest of the number that you dialed.

Routing service replaces a number of tasks that otherwise have to be done manually, including:

- entering a line pool code
- dialing an access code for a long distance carrier
- deciding which line pool to use according to the time and day

3. Routing	
Define routes	
Route: _	
Use Pool A	
DialOut Max 24 digits	
Dest codes	
DestCode: _	
Normal rte: 999	
Digit absorb: All	
Night rte:	
Evening rte:	
Lunch rte:	
Mode 4 rte:	
Mode 5 rte:	
Mode 6 rte:	

The installer can set up routing to take advantage of any leased or discounted routes using information supplied by the customer. The system itself cannot tell which lines are cheaper to use.

Using routing to create a transparent dialing plan or coordinated dialing plan is explained in the Networking with Norstar chapter of this guide.

**Plan your routing service before doing any programming**

Routing affects every call placed in the system and must be carefully planned to avoid conflicts and gaps in the programming. Use the tables in the *Programming Record* to design routes and destination codes, then check for potential problems before you start programming. It will also save you time to have all the settings written out in front of you.

Creating destination codes

The numbers used for destination codes must not conflict with:

- Call Park Prefix
- External Access Code
- Direct Dial Numbers
- Line Pool Code
- internal extension numbers (intercom)
- DISA extension numbers
- Auto DNs

For example, the system will confuse an internal number of 221 and a destination code of 22 because even if the caller dialed the complete internal number, the call would be routed using the first two digits. But an internal number of 221 and a destination code of 23 would work.

The following are the *default* numbers automatically assigned in XC 1.1 with Companion Wireless capability:

System type	Expansion used	Initial digits pre-assigned
mini	no expansion	0, 1, 2, 6 & 9
midi	one 2-port cartridge	0, 1, 2, 3, 6 & 9
maxi	one 6-port cartridge	0, 1, 2, 3, 4, 6 & 9
mega	two 6-port cartridges or two combo cartridges	0, 1, 2, 3, 4, 5, 6 & 9

The following are the *default* numbers automatically assigned in a DR 1.1 system:

System type	Expansion used	Initial digits pre-assigned
mini (2 digit DN)	no expansion	0, 1, 2, 3, 4, 5, 6, 7, 8 & 9
midi	one 2-port cartridge	0, 1, 2, 3 & 9
maxi	one 6-port cartridge	0, 1, 2, 3, 4 & 9

In order to make digits available for use with destination codes, you must change the DN length of B1 and B2 DNs depending on your system size. This can be done either at system startup or in **System Data** of Configuration programming. The examples shown above use a 3 digit DN length unless stated otherwise.

Example

If you are using a mini system, change the DN length from 2 (default setting) to 3.

Creating routes and destination codes

Programming for a routing service is made up of:

- 500 destination codes (up to 7 digits)
- a 3-digit route number (001-999)
- a line pool
- DialOut digits (up to 24)
- a schedule (programmed in Service Modes)

**Routing table modifications**

Changes to the routing tables can only be made during least busy call times or on an idle system. Plan to program the routing tables when user activity is at a minimum.

Alternatively, Norstar Manager™ can be used to back up, modify and restore these tables.

To dial a telephone number which does not match any of the programmed destination codes, the user will have to choose a line and dial the number. For long distance dialing to be consistent, all area codes in the North American numbering plan should be programmed as destination codes.

Setting up a route for local calling

An office may have different suppliers for local and long distance telephone service. By programming a destination code, any call that begins with 9 (the most common dial out digit) will automatically use lines dedicated to local service.

The first step is to build a route (under 3. Routing).

- enter 001 (or any other available route number) at **Route:**
Press SCAN to view defined routes and CLEAR to erase a defined route.
- assuming that the lines for local calling have been placed in Line pool A, choose it as the line pool
- enter the DialOut digits (if any) which are needed to direct the call once it is connected to an external line

For local calls only, there are no DialOut numbers (compare with long distance dialing below).

The second step of programming is setting up how the route will work with a destination code. Because users will dial 9 to make an external call, 9 should be the destination code.

- Press ADD and enter 9 at **DestCode:**

A valid destination code must be used. See Creating destination codes on page 165.

To view existing destination codes press before entering a new code. Press ROUTE and enter a route number to find an existing code that uses a particular route.

The destination code can use a different route depending on the Service Mode (see Service Modes in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*). In the current example, Route 001 is used when someone dials 9 during normal mode (the mode used when the other Service Modes are turned off).

- Press . The route for the first service mode appears: **Normal rte:**. Press CHANGE and enter the defined route number 002.

Next, specify the number of digits that the system needs to absorb. You can specify the portion of the destination code that is always absorbed by the system and not used in the dial-out sequence. In the current example, 9 is the destination code. Therefore, the number of digits to be absorbed should be pre-specified as one.

- Press . At **Digit absorb:** press CHANGE until 1 appears.

The following illustrations show the tables used for planning and recording routing service found in the *Programming Record*. They are filled out to match the examples of routes for local and long distance calling.

To record more than 46 routes, photocopy this page BEFORE using.

Define routes (A, Configuration: 3, Routing)

Route # (001-999)	Use pool	DialOut (if required) (max. 24 digits or characters)
001	A B C D E F G H I J K L M N O	NONE
002	A B C D E F G H I J K L M N O	I
	A B C D E F G H I J K L M N O	
	A B C D E F G H I J K L M N O	

To record more than 40 destination codes (max. 50)

Destination codes (A, Configuration: 3, Routing)

Service Mode	Normal	Mode 1	Mode 2	Mode 3
Mode name (max. 7 char.)	Normal	Night	Evening	Lunch
Use digit absorb? (max. 2 modes only)	X	X		
DestCode (max. 7 digits)	Absorb length	Use route (001-999)		
9	All 0-999-001			
1	All 1-999-001			

Tips

The digit absorption setting (**Digit absorb:**) only applies to a maximum of two service modes.

Setting Digit absorption to 0 minimizes the effort involved in preparing destination codes. With a 0 setting, the actual digits dialed by a caller are preserved in the dialout sequence. Programming a DialOut sequence as part of the route is not necessary.

Setting up a route for long distance calling

An office may have leased lines or E&M trunks which make it cheaper to call long distance. The routing should take place automatically when the number of the outgoing call begins with 1.

Again, the first step is to define a route (under **3. Routing**).

- enter 002 (or any other available route number) at **Route:**
- assuming that the discounted lines for calling long distance have been placed in Line pool B, choose it as the line pool

Because the system "absorbs" the 1 as a destination code, the routing programming has to add it back on as the DialOut. The DialOut information makes the number you dialed complete again and ready to be directed by the long distance carrier.

- enter 1 for the DialOut
- enter 1 at **DestCode:**

A valid destination code must be used. See Creating destination codes on page 165.

To view existing destination codes press before entering a new code. Press **ROUTE** and enter a route number to find an existing code that uses a particular route.

The destination code can use a different route depending on the Service Mode (see Service Modes in the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*). In this example, the system uses Route 002 (which uses Line pool B) to take advantage of the lower cost when the system is in normal mode.

- Press . The route for the first service mode appears: **Normal rte:**. Press **CHANGE** and enter the defined route number 002.

In the current example, the destination code 1 should be duplicated in the dial-out sequence in order to direct the call to the public carrier network. The number of digits to be absorbed should be one.

- Press . At Digit absorb: press CHANGE until 1 appears.

Tips

The digit absorption setting (Digit absorb:) only applies to a maximum of two service modes.

Setting Digit absorption to 0 minimizes the effort involved in preparing destination codes. With a 0 setting, the actual digits dialed by a caller are preserved in the dialout sequence. Programming a DialOut sequence as part of the route is not necessary.

If rates change depending on the time of the day or week, a different route can be used for the same destination code 1 when a particular service mode is in use. See "Programming for least cost routing".

Adding a long distance carrier access code

In many cases, long distance service uses the same lines as local service but is switched to a specific carrier using an access number (sometimes called an equal access code). Programming for routing can include the access number so users don't have to dial it every time they make a long distance call.

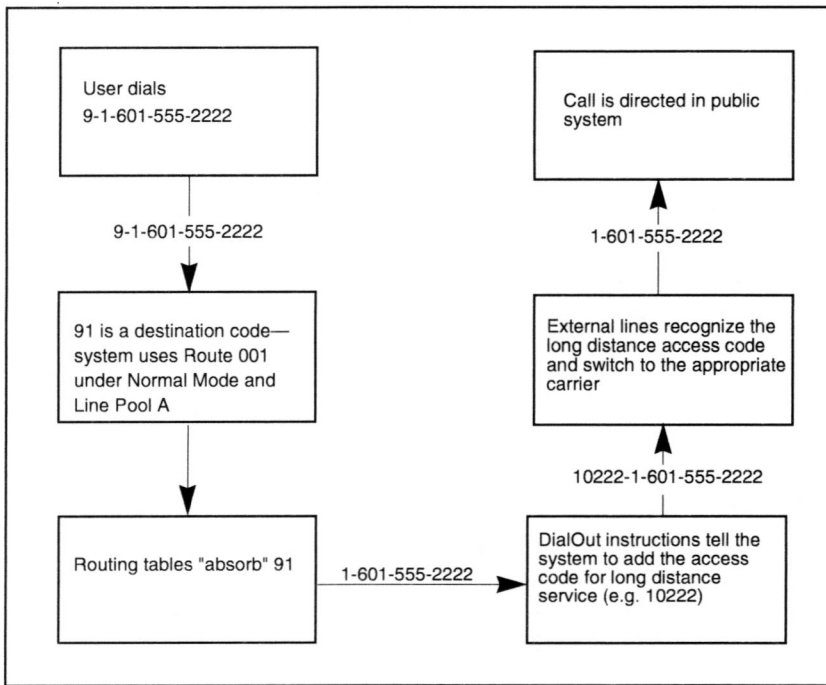
- create a route that uses a line pool containing local lines only
- enter the DialOut digits, which are the same as the access digits

For example, if the access code was 10222, the DialOut digits would be 10222.

- create a destination code 91: 9 (for outside access) and 1 (for long distance)

A valid destination code must be used. See Creating destination codes on page 165.

- set digit absorb to 1. The 9 is only used internally and should be dropped.
- The 1 is needed to direct the call to the public carrier network.



Tips

The destination codes 9 and 91 used in the examples cannot be used together. If the destination code 91 is needed to direct long distance calls, you must create a separate set of codes that use local calling routes. These codes would be, for example, 90, 92, 93, 94, 95, 96, 97, 98 and 99.

Programming for “least cost routing”

It may be cheaper to use another long distance carrier at another time of day. Continuing with the example used in the previous flowchart, the lines that supply local service in normal mode will also be used for long distance service after 6 p.m. because that is when rates become competitive. For the system to do this automatically, another route has to be built.

- choose Route 007 (or any other available route) at Route:
- choose Line pool A (local service carrier lines)

In this case, the change in route uses the start and stop times for Night Mode (the schedule for different modes are set up under Service Modes in Administration programming).

- enter 91 at DestCode:
- leave 001 as the route used by Normal rte:
- make sure Digit absorb is set at 1
- under Night rte: select Route 007
- make sure Digit absorb is set at 1

Now calls that begin with the 91 digits will be routed without using the access code. This is the case when Night Mode is invoked automatically or using a control telephone.

Overflow routing

If all the lines used by a route are busy when a call is made, the mode may be programmed to overflow to the route used for normal mode. If this happens, the set will sound a warning tone and display the message *Expensive route*. The caller can then release the call to avoid using the normal route or continue with the call.

Overflow routing is turned on or off for each Service Mode in Administration programming. See the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide*.

Tips

A service mode must be active for overflow routing to be in effect. Overflow routing is not available in normal mode.

You must create an overflow route to be used with each destination code. In this way, every route used with a scheduled mode that has overflow service must have an alternate route in normal service.

Using dialing filters with routing

Routing service can be further customized by adding dialing filters to lines in line pools. Filters restrict the use of the line to specific area codes. See the Benefits section of "Networking with Norstar" in this guide and the Programming chapter of the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for more information.

Tips

Host system signalling codes can be part of the DialOut. See the *Norstar-PLUS Modular ICS 1.1 System Coordinator Guide* for details on host system signaling codes.

You can also use routing as an alternate method for a direct-dial number. For example, create a destination code 0 and program the number of the internal or external destination as the DialOut. Digit absorption should be set to 1.

Because overflow routing directs calls using alternate line pools, a call may be affected by different line filters when it is handled by overflow routing.

Call Handling

Call Handling allows you to program system-wide characteristics. These characteristics are not associated with any specific line or telephone.

4. Call Handling

Held reminder	N
(if HLR=Y) Remind delay	60
DRT to prime	Y
(if DRT=Y) DRT delay	3
Trnsfr callbk	3
Park prefix	3
Park timeout	45
Park mode	Lowest
Camp timeout	45
Directd pickup	Y
On hold	Tones
Page tone	Y
PageTimeout	2700

Held reminder

When active, Held Line Reminder reminds you that a call at your telephone is still on hold. You periodically hear two tones from your telephone until you return to the call on hold. Press CHANGE to select the setting: **N** (No) or **Y** (Yes).

Remind delay

Held Line Reminder delay allows you to choose the number of seconds before the Held Line Reminder feature begins at a telephone that has an external call on hold. Press CHANGE to select the setting: 30, **60**, 90, 120, 150, or 180 seconds.

Tips

The Held Line Reminder delay can be programmed only if Held Line Reminder is activated.

DRT to prime

Delayed Ring Transfer automatically forwards unanswered external calls to a prime telephone, after a certain period of time. This helps ensure that no external call goes unanswered.

Press CHANGE to select the setting: **Y** (Yes) or **N** (No).

Tips

An operational prime telephone must be assigned before this feature can operate. A prime telephone is assigned to one or more external lines in the Line Data section of Configuration programming.

DRT delay

Delayed Ring Transfer delay allows you to specify the number of rings before Delayed Ring Transfer transfers a call to a prime telephone. Press CHANGE to select the setting: 1, 2, **3**, 4, 6, or 10 rings.

Tips

The Delayed Ring Transfer delay can be programmed only if Delayed Ring Transfer is activated.

You can estimate the delay in seconds if you multiply the number of rings by six.

Trnsfr Callbk

Transfer Callback delay allows you to specify the number of rings before a Callback occurs on a transferred call.

Press CHANGE to select the setting: **3**, 4, 5, 6, or 12 rings.

Tips

You can estimate the delay in seconds if you multiply the number of rings by six.

Park prefix

The Park prefix is the first digit of the call park retrieval code that must be entered to retrieve a parked call. If the Park prefix is set to None, calls cannot be parked.

Press CHANGE to select the setting: 1 to 9, N (None), or 0.

Tips

The Park prefix cannot be the same as: the Direct-dial digit, the External Line access code, the first digit of a DN, the first digit of a line pool access code, or the first digit of a destination code.

Other programmable settings may affect which numbers appear on the display during programming. Although the numbers 0 to 9 are valid Park prefix settings, some may have been already assigned elsewhere by default or by programming changes. (To avoid a conflict, refer to the table of default settings in the description of External code.)

If DN length is changed, and the changed DNs conflict with the Park prefix, the setting changes to None.

Park timeout

Park timeout allows you to assign the number of seconds before a parked call on an external line returns to the originating telephone.

Press CHANGE to select the setting: 30, **45**, 60, 90, 120, 150, 180, 300, or 600 seconds.

Park mode

Park mode allows you to select the method by which call park retrieval codes are assigned. By default, the system is configured to assign the lowest code available. The second option assigns codes in a cyclical fashion from the lowest to the highest.

Press CHANGE to select the setting: **Lowest**, Cycle.

Camp timeout

Camp timeout delay allows you to assign the number of seconds before an unanswered camped call is returned to the telephone which camped the call.

Press CHANGE to select the setting: 30, **45**, 60, 90, 120, 150, or 180 seconds.

Directed pickup

Directed pickup allows you to answer any calls by specifying the ringing telephone's internal number.

Press CHANGE to select the setting: **Y** (Yes) or **N** (No).

Tips

Directed pickup is not to be confused with the Call Pickup Group feature in Administration programming, which allows you to answer a call at any telephone within a specific group without specifying the internal number of the ringing telephone.

Like Call Pickup Group, Directed pickup is useful when not all the telephones have been assigned the same lines, but you still want to allow your co-workers to answer a call on any external line from their telephones.

On hold

On hold allows you to choose what a caller hears on an external line when the line has been put on hold.

Press CHANGE to select the setting: **Tones**, **Music**, or **Silence**.

Tones provides a periodic tone.

Music provides any signal from a source such as a radio connected to the ICS.

Silence provides no audio feedback.

Page tone

You can choose whether a tone sounds before a page begins.

Press CHANGE to select the setting: **Y** (Yes) or **N** (No).

Page Timeout

The paging feature is automatically disconnected after a set length of time.

Press CHANGE to select the maximum number of seconds needed for a page: 15, 30, 60, 120, 180, 300, **2700**.

Miscellaneous

Miscellaneous allows you to program system-wide characteristics. These characteristics are not associated with any specific line or telephone.

5. Miscellaneous	
Backgrnd music	N
Direct-dial #	0
DISA DN	None
Auto DN	None
Alarm set	221
CAP assignment	
CAP1	None
CAP2	None
CAP3	None
CAP4	None
CAP5	None
Link time	600
Set relocation	N
Host delay	1000
Receiver volume	Use systm volume
External code	
Line pool codes	
Line pool A Max.4 digits	9
Installer psw	CONFIG
Daylight time	Y

Backgrnd music

Background Music allows you to listen to music through your telephone speaker. A music source must be connected to the Integrated Communication System.

Press CHANGE to select the setting: **N** (No) or **Y** (Yes).

Direct-dial

Direct-dial digit allows you to dial a single system-wide digit that can be used to call a specific telephone, called a Direct-dial telephone.

Press CHANGE to select the setting: **0** to 9, or **N** (None).

Tips

There can be as many as five direct-dial telephones in a system. The direct-dial telephone to which specific telephones connect is assigned in Administration (**4. Direct-Dial** and **5. Capabilities**).

People with common interests should be in the same direct-dial group. For instance, the secretary who can best handle calls or questions for a group could have a telephone assigned as the direct-dial telephone for that group.

Another direct-dial telephone, an extra-dial telephone, can be assigned for each Service Mode in Service Modes programming.

The direct-dial digit cannot be the same as the first digit of a DN, of a line pool access code, the external line access code or the Call Park prefix. It cannot be the first digit of a destination code.

If DN length is changed, and the changed DNs conflict with the direct-dial digit, the setting changes to **N**.

DISA DN

For calls answered with DISA, the system presents a stuttered dial tone to prompt a caller to enter a valid password. The Class of Service (COS) that applies to the call is determined by this COS password.

Once a remote user is on the Norstar system, the DISA DN can be used to change the existing Class of Service.

Use CHANGE and the dial pad to enter the digits to be received from the auto-answer trunk. Press to set the DISA DN to None.

Tips

The length of the DISA DN is the same as the Rec'd # length specified in *System Data*. The DISA DN is cleared if the Received number length is changed.

The DISA DN cannot be the same as a line pool access code or a destination code.

Auto DN

For calls answered without DISA, no password is required to access the Norstar system. The Class of Service (COS) that applies to the call is determined by the COS for the trunk on which the user is calling. Use CHANGE and the dial pad to enter the digits to be received from the auto-answer trunk. Press to set the Auto DN to None.

Tips

The length of the Auto DN is the same as the Rec'd # length specified in *System Data*. The Auto DN is cleared if the Received number length is changed.

The Auto DN cannot be the same as a line pool access code or a destination code.

Alarm set

Alarm telephone allows you to assign a telephone on which alarm messages appear when a problem has been detected in the system. Use CHANGE and the dial pad to enter the internal number of the Alarm telephone. Press to set the Alarm telephone to None. The default setting is **221**.

CAP assignment

This setting designates a telephone as a central answering position (CAP). The CAP must be an M7324 telephone, and may have one or two CAP modules attached. A maximum of five CAPs can be installed in a Norstar system.

The CAP may be used to:

- monitor the busy/not busy and Do Not Disturb status of Norstar telephones
- answer external calls on up to 120 lines, and extend calls to other Norstar telephones
- send up to 30 messages to other Norstar telephones
- provide up to 96 extra memory buttons for the M7324 telephone

Use , CHANGE and the dial pad to enter the internal number of the M7324 telephone to be designated a CAP.

Tips

If CAP modules are attached to an M7324 telephone that has not been programmed as a CAP, then no CAP settings are assigned.

If a CAP module (or modules) is relocated with the M7324 telephone, the settings are retained.

Link time

Link time allows you to specify the duration of a signal required to access a feature through a remote system. Press CHANGE to select the setting: 100, 200, 300, 400, 500, **600**, 700, 800, 900, or 1000 milliseconds.

For example, to program external dialing through a Centrex system, which requires a Link time of 400 ms, specify a Link time of 400.

Tips

The Link time required depends on the requirements of the host switching system that must be accessed.

Link is another name for recall or flash.

Set relocation

Telephone relocation allows you to move any telephone to a new location within the Norstar system without losing the directory number, autodial settings, personal speed dial codes, and any Configuration and Administration programming for that telephone. Press CHANGE to select the setting: **N** (No) and **Y** (Yes).

Tips

It is advisable to activate Telephone relocation after the telephone installation and programming has been done. This provides you with more flexibility in testing equipment.

If this feature is deactivated while a telephone is moved, that telephone's internal number and Administration data remain with the physical port on the ICS, and the telephone does not receive the original programming when it is reconnected elsewhere.

Host delay

Host delay lets you assign the delay between the moment an outgoing line is selected to make an external call (by lifting the receiver off the telephone, for example) and the moment that Norstar sends dialed digits or codes on the line. Press CHANGE to select the setting: 200, 400, 600, 800, **1000**, 1200, 1400, 1600, 1800, or 2000 milliseconds.

Tips

Host delay is provided to ensure that a dial tone is present before the dialing sequence is sent. Minimizing this delay provides faster access to the requested features.

Receiver volume

Receiver volume allows you to specify whether the volume level of a receiver or headset will return to the system default level when a call is ended or put on hold, or whether it will remain at the level set at the individual telephone.

Use and CHANGE to select the setting: **Use system volume** or Use set volume.

Tips

This feature is not available on some older telephones.

External code

External code allows you to assign the external line access code. This code is used to allow M7100 telephones and Analog Terminal Adapters (ATA) to access external lines.

Use CHANGE and the dial pad to program the single digit access code. There is no default access code for this setting.

Tips

The external line access code cannot conflict with: the Park prefix, the direct-dial digit, the first digit of a line pool access code, the first digit of a DN, or the first digit of a destination code.

If DN range, and the changed DNs conflict with the external line access code, the setting changes to None.

Digits assigned by default to Configuration settings

Digit	Use	Heading
0	direct-dial digit	5. Miscellaneous
1	Park prefix	4. Call handling
2	the first digit of B1 DNs	Startup
— —	external line access code	5. Miscellaneous
9	line pool A access code (Takes precedence over the External Line access code if there is a conflict.)	5. Miscellaneous
— —	destination code	3. Routing

Line pool codes

This setting allows you to assign a line pool access code for each of the fifteen line pools (A to O). These codes are used to specify the line pool you wish to use for making an outgoing external call.

If your system is installed without expansion cards, the DN default is 2 digits. Therefore, B1 DNs will be from 21 to 52 and the B2 DNs are assigned from 53 to 84. The B2 DN range is 80 to 84; therefore, the single digit 8 is not available for a line pool access code.

Use , CHANGE, the dial pad, and OK to program the access code. The default access code is **9** for Line Pool A.

Tips

The code can be one to four digits in length. Line pool access codes starting with the same digit must be the same length.

A line pool access code can be the same as an external line access code. In this case, the line pool access code takes priority over the external line access code, and a line from the line pool is selected.

A line pool access code cannot conflict with: the Park prefix, the Direct-dial digit; the first digit of any Received number; the first digit of any DN (including the Auto DN or the DISA DN).

To avoid a conflict, refer to the table of default settings in the description of External code.

Installer password

This setting allows you to change the Installer password that allows access to Configuration programming.

Use CHANGE, the dial pad, and OK to program the Installer password.

Record the password in the *Programming Record*.

Tips

You can choose any combination of one to six digits. It is easier to remember the password if the digits spell a word. Provide this password only to selected personnel to prevent unauthorized access to Configuration programming. The implications of such access may include the rearrangement of line assignments, which could affect the operation of the Norstar system.

The default Installer password is **266344 (CONFIG)**.

Daylight time

When this feature is turned on, your system will automatically switch between standard time and daylight savings time. Press CHANGE, to select the setting: **Y** (Yes) or **N** (No).

Tips

The hour falls back one hour on the last Sunday of October at 2:00 am., and it advances one hour on the first Sunday of April at 2:00 am. This function should only be programmed by your installer.

In regions where daylight savings time does not apply make sure this setting is changed to **N** (No).

Radio Data

Radio Data is used for programming Norstar systems which use Companion components. See the *Norstar-Companion MICS-XC 1.1 Installer Guide* for information.

System Data

System Data allows you to specify system-wide settings.

DR 1.1

6. System Data

Individual DNs

Old DN: _ Max. 7 digits

New DN: _ Max. 7 digits

DN length **3**
(‘2’ on non-expanded system)

Rec'd # length **3**

XC 1.1

7. System Data

Individual DNs

Old DN: _ Max. 7 digits

New DN: _ Max. 7 digits

DN length **3**
(‘2’ on non-expanded system)

Rec'd # length **3**

When updating set data using *System Data*, those Norstar sets which are busy during the programming session are not updated immediately. Norstar provides a confirmation that programming changes have taken affect for each set after exiting a programming session. Please refer to the section Confirmation of changes to set data on page 114 for more information.

Individual DNs

Individual DNs allows you to change the Directory Number (DN) or internal number of a telephone.



Changing DN locks Configuration session

Changing an individual DN locks the Configuration session into the System Data programming mode. When the System Data session ends, re-enter the Configuration access code and the Installer password to continue with other Configuration or General Administration programming.

Do not perform Startup again, or all previous programming will be erased.

Use , the dial pad, and OK to identify the DN you want to change. Then, use the dial pad, and OK to enter the new DN.

Tips

No DN changes occur until the Configuration session ends.

If the “new DN” already exists for another telephone, that other telephone is given the “old DN”.

All DNs must be the same length.

The first digit of a new DN cannot be the same as the first digit of: an external line access code; a line pool access code; the Park prefix; the Direct-dial digit. To avoid a conflict, refer to the table of default settings in the description of External code.

The lowest default DN for a non-expanded system is **21**, and the lowest default DN for an expanded system is **221**.

DN length

This feature allows you to change the number of digits for all internal DNs. The maximum length is seven. The default and minimum length is **3** for an expanded (with Expansion Cartridge) Norstar system, and **2** for a non-expanded Norstar system.

1. Press CHANGE to select the setting: **2**, **3**, **4**, **5**, **6**, or **7** for a non-expanded system; or **3**, **4**, **5**, **6**, or **7** for an expanded system ('2' is not available for an expanded system).
2. Press to save the new DN length. The display reads **Drop data calls?**.

3. Press YES to save the new DN length. NO restores the original value.



Data devices will drop calls

You must wait for at least two minutes after a system startup before you change the DN length.

Data devices drop calls when the DN length is changed. (Data devices use the B2 channel. The M7100, M7208, M7310, and M7324 telephones use the B1 channel. Calls are **not** dropped for these telephones.)

The DN length change is completed within two minutes, depending on the size of the installed Norstar system. System response may briefly slow down during this time. You cannot re-enter Configuration programming during this time. If you enter the Configuration access code, the message **In use: SYSTEM** appears on the display.

Tips

A non-expanded system (with a default DN length of 2) is automatically changed to a DN length of 3 after an expansion cartridge is installed and power is restored to the ICS.

If any future expansion is planned, the DN length should be set to three, even on non-expanded systems.

A DN length change, if required, should be the first programming change on a newly installed Norstar system.

Each increase in length places the digit 2 in front of any existing DN. For example, if DN 3444 was increased to a length of 6, the new DN would be 223444.

If the DN length is changed so that a conflict is created with the Park prefix, external line access code, Direct-dial digit, or any line pool access code, the setting for the prefix or code is changed to None, and the corresponding feature is disabled.

Rec'd # length

The Received number length setting allows you to change the number of digits received on auto-answer trunks. These digits are used to identify target lines, Auto DN's, and DISA DN's. The default for a non-expanded system is **2**. The default for an expanded system is **3**. Press CHANGE to select the setting: 2, 3, 4, 5, 6, or 7. Then, press to enter the new Received number length.

Tips

The target line number (for example, line 181) and the Received number for the target line (for example, Rec'd #: 1234 for line 181) are two different numbers.

The Received number length may be the same as the system DN length, or may, because of network or CO constraints, be set to some other value.

Target lines are supported only on expanded Norstar systems or unexpanded systems that have T1 lines.

Changing the Received number length causes all programmed received digits to be cleared.

Set copy

Set copy allows you to copy programmed data from one telephone to another. You have two choices when deciding which data to copy. You can copy:

- system data only
- system data and personal programming data

System data is programmed in Configuration and Administration. Personal programming data is programmed by people at their own telephones, in order to customize their telephones to their own needs.

When updating set data using *System Data* or Set Copy, those Norstar sets which are busy during the programming session are not updated immediately. Norstar provides a confirmation that programming changes have taken effect for each set after exiting a programming session. Please refer to the section Confirmation of changes to set data on page 114 for more information.

Tips

Set copy operates only from the Norstar M7310 or M7324 telephones.

Do not confuse Set copy with the Copy display button. COPY is more selective than Set copy. It allows you to copy specific groups of data from one telephone to another telephone or from one external line to another external line. You can copy more selective groups of System data listed in the table below by pressing COPY when it appears.

If you are copying both system data and personal programming data, the source and destination telephones must each be the same Norstar model. If you are copying System data only, the telephones can be different Norstar models.

Copying data to a telephone overrides any of that telephone's previous programming.

Know which data can and cannot be copied. These are shown in the following two charts.

System data

System data which CANNOT be copied	System data which CAN be copied	
Alarm telephone designation	Answer button assignments	Paging
Auto Call Info telephone designation for a line	Automatic Handsfree	Page Zone
CAP assignment	Autolog/Show Vmsg	Pickup Group
Direct-dial telephone designation	Auxiliary ringer	Prime line designation
Directory Number (DN)	Call Forward No Answer	Priority Call permission
Extra-dial telephone designation	Call Forward No Answer Delay	Allow Last Number Redial
Log space	Call Forward On Busy	Allow Saved Number Redial
Service Modes Control telephone designation for a line or set	Direct-dial Group	Allow Link
Service Modes Ringing telephone designation for a line	First Display	Redirect Ring
Prime telephone designation for a line	Full Handsfree	Ringing line preference
Private line appearances	Handsfree Answerback	Telephone Administration Lock
Telephone Name	Hotline	Telephone Filter
	Line assignment	
	Line pool access	
	Line / Telephone Filter	
	Number of intercom buttons	

Personal programming data

Personal programming data which CANNOT be copied	Personal programming data which CAN be copied
Autobumping Call log options Contrast Adjustment Log password Ring type Ring volume CAP module memory button assignments Dialing modes (Automatic Dial, Pre-Dial, Standard Dial)	Language Choice Line button positions Personal Speed Dial entries Telephone memory button assignments (Internal Autodial, External Autodial, and feature access)

Copying set programming

1. Access Configuration programming. The display reads **A. Configuration**.
2. Press until the display reads **C. Set copy**.
3. Press . The display reads **Copy:SYSTEM** data.
4. Press **CHANGE** to toggle the setting.
5. Press .
6. Enter the internal number of the telephone from which you want to copy data.
7. Enter the internal number of the telephone to which you wish to copy data.
8. To copy the same data to another telephone, repeat step 7.
Press to return to **C. Set copy**.
Press to end the session.

System ID

The System ID (or System Security number) can be accessed on any M7324 or M7310 telephone display by pressing

* * S Y S I D , or * * 7 9 7 4 3 .

Software Codes

Software Codes is used for activating Companion components on systems running the USA-MICS-XC software. See the *Norstar-Companion MICS-XC 1.1 Installer Guide* for more information.

Applying button cap labels

Applying the button cap labels

Before you apply button labels, activate the Button Inquiry feature (*) to verify the button functions, and to avoid activating features as you put the labels onto the buttons.

Keep the extra labels and button caps with each Norstar telephone or leave them with the system coordinator.

Types of button caps

- **Unlabeled, clear button caps**
with appropriate green or grey paper for typing in line numbers, telephone numbers, and features
- **Pre-printed, colored button caps**
in green or grey

Some examples of pre-printed button caps

Green caps	Grey caps
Line 1	Last No.
Handsfree Mute	Speed Dial

Tips

To make identification of line types easier, use preprinted green button caps for lines that support incoming and outgoing calls. Use clear button caps for target lines that are incoming only.

Identifying the telephones

1. Write the individual telephone numbers on the labels and attach them to the appropriate Norstar telephones.
2. Write the telephone number and the internal number on the appropriate *Norstar Receiver Card* for each type and color of telephone that is to be installed.
3. Cover the *Norstar Receiver Card* underneath the receiver of each telephone with the plastic lens.

Norstar default button assignments

During Startup, the installer chooses one of the available templates:

- for DR 1.1 systems: Square, Centrex, Hybrid, PBX or DID
- for XC 1.1 systems: PBX or DID

Default features are assigned automatically to the programmable buttons on Norstar telephones, and vary with the template and the telephone. The default features are listed in the tables in this chapter.

Tips

Norstar telephones are shipped from the factory with the button caps in place for the Square template.

Rules of default button assignment

Line and Intercom buttons are assigned by default templates and can be changed in Configuration programming. Handsfree/Mute and answer buttons are not assigned by default. If these features are defined, however, they are automatically assigned to specific buttons, as described on this and the following page. None of these buttons can be assigned to M7100 telephones.

The Handsfree/Mute feature appears on the bottom right-hand button (the bottom button on the M7208 telephone), moving the Intercom button(s) up one position.

Each telephone can have up to eight Intercom buttons. They appear above the Handsfree/Mute button at the bottom right-hand position on your telephone (the bottom button on the M7208 telephone).

Each telephone can have up to four answer buttons. They appear above Intercom buttons in the right column and continue up from the bottom in the left column, replacing the features on those buttons. (On the M7208 telephone, answer buttons appear above Intercom buttons and below external line buttons in a single column.)

External line buttons appear in ascending line order, starting at the top button in the left column (the top button on the M7208 telephone). If more than five external lines are assigned to an M7310 telephone, or more than 12 to an M7324 telephone, assignment continues down the buttons on the right column, erasing the features on those buttons. Line buttons have priority over feature access buttons but not Handsfree/Mute, Intercom, or answer buttons.

M7100 telephone button defaults

For Square, Centrex, Hybrid, PBX, and DID templates, the one programmable button on the M7100 telephone is .

M7208 telephone button defaults

The default button assignments for the M7208 telephone depend on the template applied.

Square	Centrex	Hybrid	PBX	DID
Line 1	Line<xx>	Line 1	Pick-Up	Line<xx>
Line 2	Transfer	Line pool	Transfer	Transfer
Last No.	Last No.	Last No.	Last No.	Last No.
Page	Link	Page	Page	Page
Conf/Trans	Conf/Trans	Conf/Trans	Conf/Trans	Conf/Trans
Speed Dial	Speed Dial	Speed Dial	Speed Dial	Speed Dial
Intercom	Intercom	Intercom	Intercom	Intercom
Intercom	Intercom	Intercom	Intercom	Intercom

Tips

The default Page button activates the External Page option ().

M7310 telephone button defaults

The default button assignments for the M7310 telephone depend on the template applied. The exception is the default numbering for the dual memory buttons.

Dual memory buttons

Set 233	Set 237	Set 241
Set 221	Set 225	Set 229
Set 234	Set 238	Set 242
Set 222	Set 226	Set 230
Set 235	Set 239	Set 243
Set 223	Set 227	Set 231
Set 236	Set 240	Set 244
Set 224	Set 228	Set 232

This example shows defaults for a system with three-digit internal numbers.

These defaults do not actually exist on any telephone, as no telephone has an autodial button for itself. The position that would be taken by the autodial button for itself, is blank.

Template button assignments

Square		Centrex		Hybrid	
Line 1	Conf/Trans	Line<xx>	Conf/Trans	Line 1	Conf/Trans
Line 2	Last No.	Transfer	Last No.	Line pool	Last No.
Call Fwd	Voice Call	Call Fwd	Voice Call	Call Fwd	Voice Call
Pick-Up	Intercom	Pick-Up	Intercom	Pick-Up	Intercom
Page	Intercom	Link	Intercom	Page	Intercom

PBX		DID	
DND	Conf/Trans	Line<xx>	Conf/Trans
Transfer	Last No.	Transfer	Last No.
Call Fwd	Voice Call	Call Fwd	Voice Call
Pick-Up	Intercom	Pick-Up	Intercom
Page	Intercom	Page	Intercom

M7324 telephone button defaults

The default button assignments for the M7324 telephone depend on the template applied.

Square		Centrex		Hybrid	
Line 1	Call Fwd	Line<xx>	Call Fwd	Line 1	Call Fwd
Line 2	Speed Dial	blank	Speed Dial	Line pool	Speed Dial
blank	Last No.	blank	Last No.	blank	Last No.
blank	Saved No.	blank	Link	blank	Saved No.
blank	Conf/Trans	blank	Conf/Trans	blank	Conf/Trans
blank	Transfer	blank	Transfer	blank	Transfer
blank	DND	blank	DND	blank	DND
blank	Pick-Up	blank	Pick-Up	blank	Pick-Up
blank	Voice Call	blank	Voice Call	blank	Voice Call
blank	Page	blank	Page	blank	Page
blank	Intercom	blank	Intercom	blank	Intercom
blank	Intercom	blank	Intercom	blank	Intercom

PBX		DID	
blank	Call Fwd	Line<xx>	Call Fwd
blank	Speed Dial	Transfer	Speed Dial
blank	Last No.	blank	Last No.
blank	Saved No.	blank	Saved No.
blank	Conf/Trans	blank	Conf/Trans
blank	Transfer	blank	Transfer
blank	DND	blank	DND
blank	Pick-Up	blank	Pick-Up
blank	Voice Call	blank	Voice Call
blank	Page	blank	Page
blank	Intercom	blank	Intercom
blank	Intercom	blank	Intercom

Testing

After your system has been installed and programmed, test it to verify that the equipment is functioning properly.



Notify service provider of T1 signaling disruption

Notify your T1 service provider before disconnecting your T1 lines, removing power to your system, or performing any other action that disrupts your T1 signaling. Failure to notify your T1 service provider may result in a loss of T1 service.

Testing procedures for Companion Wireless components are included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Verifying wiring connections

Verify all wiring and connections to make sure they are correct and secure.

Verifying that all modules are enabled

Use **3.Module Status** in Maintenance to verify that all modules are enabled.

Verifying that all ports are enabled

Use **2.Port/DN Status** in Maintenance to verify that all devices and lines are enabled and idle.

Testing the emergency telephones

1. Turn the system power off.
2. Pick up the receiver of each emergency telephone and verify that you hear dial tone.
3. Turn the system power back on.

Tips

The emergency telephone connections on the Trunk Module will not work if there is an E&M/DISA or DID Trunk Cartridge in the first slot of the Trunk Module.

The emergency telephone connections on the ICS will not work if DTIs are used.

Testing the Norstar telephone operations

1. Place a call to each Norstar telephone.
2. Verify the quality and clarity of all connections.
3. Check the visual indicators.
4. Program and use a memory button.

Testing the external lines

1. Place or receive a call on each external line to verify operation.
2. Verify the quality and clarity of each connection.

Testing the T1 lines

1. Run a line loopback or a payload loopback test in coordination with the T1 service provider to verify the T1 link. See Loopback Tests in the Maintenance chapter for information.

Testing the optional equipment

1. Follow the procedures in the user cards or installation documentation for the following equipment:
 - Analog Terminal Adapter (ATA)
 - auxiliary ringer (customer-supplied)
 - Busy Lamp Field (BLF)
 - central answering position (CAP) modules
 - headset (customer-supplied)
 - music source (customer-supplied)
 - paging (customer-supplied)
 - station auxiliary power supply (SAPS)

Testing Norstar system programming features

1. Try using the following programmed system features:
 - Routing
 - System Speed Dial
 - Dialing filters
 - Class of Service
 - Service Modes

Testing Automatic Telephone Relocation

1. Check that Set Relocation is enabled (Y) in 5. Miscellaneous in Configuration programming.
2. Move a wireline telephone to another location and verify that it has retained all its programming.

Tip

Automatic Telephone Relocation will not retain programming when moving a Companion Base Station from one port to another.

Troubleshooting

These troubleshooting procedures allow you to solve many problems in the Norstar system. Follow these procedures before replacing any components.



Only qualified persons should service the system

Only qualified personnel should replace components and service hardware.

Where more than one procedure is given, the procedures represent different options from which you should select just one.

Troubleshooting procedures for Companion Wireless components are included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Getting ready

Before you begin troubleshooting, gather all the information that is relevant to your network configuration:

- the *Programming Record*
- records from people who use the network
- information about other hardware and non-Norstar features within the public or private network



Notify service provider of T1 signaling disruption

Notify your T1 service provider before disconnecting your T1 lines, removing power to your system, or performing any other action that disrupts your T1 signaling. Failure to notify your T1 service provider may result in a loss of T1 service.

Tips

Remember that you can check many of the system parameters without having to go into a Configuration or Administration programming session.

- Use Line Profile (* *) from an M7310 or M7324 telephone, to check programming for any line.
- Use Set Profile (* *) from an M7310 or M7324 telephone, to check programming for any telephone.
- Use Button Inquiry (*) to check the buttons on a particular telephone.

Types of problems

The problems you encounter will likely fall into one of the following categories:

Misunderstanding of a feature

A problem may be reported because a Norstar user is unfamiliar with the operation of a given feature. You may be able to solve the problem simply by demonstrating how to use the feature correctly.

Programming errors

You may encounter problems caused by errors in programming. A feature may have been programmed incorrectly or may not have been programmed at all.

Wiring connections

Wiring problems are caused by loose, unconnected, or incorrect wiring. Use the procedures in the section on Checking the hardware as a guide.

Equipment defects

You may encounter problems caused by Norstar equipment defects. See the appropriate section for problems related to the system hardware.

General troubleshooting procedure

1. Diagnose the trouble by determining:
 - the types of problems users have experienced
 - the frequency of the problems
 - how many telephones are affected
2. Check how a feature is being used. A problem may have been reported because of a misunderstanding about how a feature works. Confirm that the person who reported a problem understands the intended use and operation of any feature in question.
3. Check for programming errors. Check that the programming recorded in the *Programming Record* is correct for the intended operation of the system, and verify that this Configuration and Administration programming has been correctly entered.
4. Check the wiring and hardware connections.
5. If the problem persists, run a Maintenance session as described in the Maintenance chapter.
6. If hardware is defective, replace it. If the trouble requires expert advice, follow your company's procedure for obtaining assistance.

Problems with telephones

Norstar telephone display unreadable

If the trouble is with an M7310 or an M7324 telephone:

1. Press * .
2. Press UP or DOWN to adjust the display to the desired level.
3. Press OK.

If the trouble is with an M7100 or M7208 telephone:

1. Press * .
2. Press a number on the dial pad to adjust the display to the desired level.
3. Press .

If the display is still unreadable:

1. Disable the problem telephone.
2. Replace the problem telephone with a known working one.
3. Enable the working telephone.

Norstar telephone dead

1. If more than one telephone is affected, refer to the Station Module down section.
2. Check for dial tone.
3. Check the display.
4. If the problem persists, replace the telephone with a known working Norstar telephone of the same type (so that the programming is retained).
5. Check the internal wiring at both the modular jack and the distribution cross-connect. A TCM port should have between 15 and 26 V DC across the Tip and Ring when the telephone is disconnected.
6. Check the line cord.

Running a Maintenance session to test a dead telephone

1. Run a Maintenance session to ensure that the telephone is not disabled. (See Port/DN Status in the Maintenance chapter.)
2. Disable the port that the telephone is connected to using the heading **2.Port/DN Status**.
3. Enable the port that the telephone is connected to using the heading **2.Port/DN Status**.

Replacing a telephone

In a powered-up system, an existing Norstar telephone can be replaced by a new Norstar telephone. A new Norstar telephone is one that was not previously in service within the system.

Replacing Norstar telephones of the same type

If an existing Norstar telephone is unplugged, and a new Norstar telephone of the same type is then plugged into the same jack (for example, replacing an M7208 telephone with another M7208 telephone), the new telephone acquires the programming and the internal number of the old telephone. This is normally done to replace a defective telephone.

Replacing Norstar telephones of different types

If an existing Norstar telephone is unplugged, and a new Norstar telephone of a different type is plugged into the same jack (for example, replacing an M7208 telephone with an M7310 telephone), the new telephone keeps the old internal number. The new telephone receives a default profile for a telephone of its type. (Refer to Applying button cap labels in the Programming chapter).

If the telephone being replaced has more lines than the new telephone, automatic outgoing line selection may not work with the Handsfree/Mute feature. A line must be selected manually.

Status of a telephone that was replaced

The old Norstar telephone that was unplugged and replaced by a new Norstar telephone loses its programming and internal number. The old telephone's internal number has been given to the new telephone and the programming has either been removed or given to the new telephone when it was plugged into the old jack. The replaced telephone (if still functional) is now treated by the system as a telephone not previously in service.

Emergency telephone dead

1. Verify that there is no power at the ICS and Trunk Modules.
2. Verify that there is no dial tone at the emergency telephone.
3. Check that the external line and emergency telephone connections have been made correctly.
4. Ensure that the emergency telephone is not faulty by connecting it directly to the external line and listening for dial tone.
5. Verify that the ICS has a Loop Start Trunk Cartridge installed. Verify that the Trunk Module has a Loop Start Trunk Cartridge installed in the left-most slot.
6. Verify that there is dial tone on lines 002 (ET1 on TC1) and 026 (ET2 on TC2) of the ICS and on the first line of each Trunk Module.
7. Replace the ICS if the emergency telephone is connected to the ICS or replace the Trunk Module if the emergency telephone is connected to the Trunk Module.

Problems with lines

The troubleshooting problems listed here focus on trouble with making calls or using lines.

Calls cannot be made (but can be received)

1. Press * .

2. Press a line button.

3. If an incorrect line number or name appears (or if neither appears) on the Norstar telephone display, check the Configuration settings.

OR

If the correct line number or name appears on the Norstar telephone display, make sure the external lines are properly cross-connected.

4. Check external lines by attaching a test telephone directly on the distribution block.
5. Ensure that the 25-pair cable is properly connected to the modules or the ICS.
6. Run a Maintenance session and verify that the module that the Trunk Cartridge is installed in is not disabled or unequipped using the heading **3.Module Status**.
7. Run a Maintenance session and disable the appropriate ports using the heading **2.Port/DN Status**. For charts showing external line port number defaults, refer to Installation chapter.
8. Enable the appropriate ports using the heading **2.Port/DN Status**.
9. If you still cannot make external calls, power down, then power up the system. This should be done after business hours to avoid losing calls.
10. To check the line, contact the telephone company.

**Notify service provider of T1 signaling disruption**

Notify your T1 service provider before disconnecting your T1 lines, removing power to your system, or performing any other action that disrupts your T1 signaling. Failure to notify your T1 service provider may result in a loss of T1 service.

Dial tone absent on external lines

1. Use Button Inquiry (*) to display the number of the external line you are testing.
2. Check for dial tone using a test telephone at the connections for the external line on the distribution block.
3. Make sure that a Trunk Cartridge for the line is properly installed in the ICS or Trunk Module.
4. Make sure that the Trunk Module fiber cable is properly connected to the Expansion Cartridge on the ICS.
5. Refer to the sections Trunk Cartridges and Trunk Module down, in this chapter.
6. Run a Maintenance session to ensure that the line is not disabled. (See Port/DN Status in the Maintenance chapter.)

Hung lines at a telephone

Line indicators that have been solid for a long time are the only visible indication that lines are hung.

Possible problem

A line that has been redirected using Line Redirection may, under some circumstances, remain busy after a call is over. If this happens, the outgoing line for the redirection also remains busy. You can clear this kind of hung line only at the telephone that was used to redirect the line.

Solution

1. Enter the Button Inquiry feature code (* 0) at the telephone that was used to redirect the line.
2. Press the button of the redirected line.
3. Press SHOW or .
4. Press DROP or .

Both the redirected line and the outgoing line for the redirection should now be cleared.

Possible problem

The supervision and/or Discon timer programming for the line do not match the settings for the line at the central office.

Solution

1. Verify that your programming for the line matches the central office settings.

Possible problem

Other.

Solution

For lines that are hung for any other reason, you will have to run a Maintenance session.

1. Run a Maintenance session and go to the heading
3. Module Status.
2. Disable and enable the affected Trunk Cartridge.

Follow the procedures in the Troubleshooting overview and the Installation check sections before proceeding.

Auto-answer line rings at a Norstar telephone

Possible problem

You configured a loop start trunk as auto-answer but the installed hardware does not support disconnect supervision. (In this case, the symptom would be accompanied by the Alarm 62 code symptom.)

Solution

1. Reconfigure the trunk as manual-answer.
OR
Replace the Trunk Cartridge with one that provides disconnect supervision.

Possible problem

The line is configured as auto-answer and unsupervised.

Solution

1. Reconfigure the line as manual-answer.
OR
Reconfigure the line as supervised.

Possible problem

The line is not equipped for disconnect supervision at the central office.

Solution

1. Reconfigure the trunk as manual-answer.

Possible problem

The Discon timer setting for the Trunk Cartridge in

1. Trk/Line Data does not match the setting for the line at the central office.

Solution

1. Reconfigure the Discon timer to match the setting at the central office.

Prime telephone gets misdialed calls

Possible problem

The digits sent by a switch at a central office or in the private network did not match any Received number, the Auto DN, or the DISA DN. The call has been routed to the prime telephone for the incoming trunk.

Solution

1. Verify that the switch is sending the correct number of digits for the Received number length defined in your system.
2. Verify all the digit strings that the switch should be sending.

3. Check that you have defined the corresponding Received number for every target line in your system.
4. Make sure that the published telephone numbers for your network are correct.

Selected line reads Not in service **or** Not available

Possible problem

You have configured a line number associated with an E&M Trunk Cartridge DTMF receiver to appear at the telephone.

Solution

1. Reconfigure the line so that it does not appear at any telephone and configure another line to replace it at the telephone.

OR

Reconfigure the line as a different type and install trunk hardware to support the new type of line.

Possible problem

The Norstar system has taken an E&M line out of service because the far end did not respond to a disconnect signal from the Norstar system. The symptom would be accompanied by event code 263 in the System Test Log.

Solution

1. Check with the operators of the system at the far end and find out if their system is operating.
2. Check that your system hardware is receiving signals properly.
3. Check the trunk between your system and the far end system for a break.
4. Check that your trunk is properly configured.
5. Run a Maintenance session and go to the heading
3. Module Status.
6. Disable and enable the affected Trunk Cartridge.

Possible problem

The Norstar system has detected no response on an E&M line from the system at the far end. The symptom will be accompanied by Event code 265 in the System Test Log.

Solution

1. Check with the operators of the system at the far end and get them to troubleshoot their system.

Possible problem

The line is connected to a DTI which is currently not in service.

Solution

1. Check if the green LED on the DTI is flashing to indicate that service is suspended.
2. Check if any yellow LEDs are on to indicate an alarm or error condition.
3. Check if the red test LED is on to indicate that a continuity loopback test is running.
4. Check that the cable connecting the DTI to the termination point from the central office or network is properly connected.
5. Check that the DTI is properly inserted in the ICS.
6. Run a Maintenance session to verify the status of the DTI.

Possible problem

The line has been disabled for maintenance purposes.

Solution

1. Enable the line.

OR

If the line will be out of service for some time, configure another line to replace it on the telephone.

Selected line pool shows No free lines

Possible problem

If this happens often, there are not enough lines in the line pool to serve the number of line pool users.

Solution

1. If the line pool contains loop start trunks, enter Configuration and move under-used loop start trunks from other line pools into the deficient line pool.

OR

If the line pool contains E&M trunks, order more trunks from the telephone company or private network vendor. Install additional Trunk Cartridges of the appropriate type. In Configuration programming, add the new trunks to the deficient line pool.

Problems with optional equipment

Analog Terminal Adapter

1. Check the connections to the jack.
2. Check the connections to the ATA.
3. Disconnect the ATA and replace it with a working Norstar telephone. If the telephone still works properly, the ICS and/or the SM are operating properly.
4. Verify that the programming has been done as described in the *Programming Record* and the *Norstar Analog Terminal Adapter Installation Card*.
5. If the trouble seems to be in the ICS or SM, double-check all wiring and programming options. If this does not help, refer to the sections on ICS down or Station Module down.

OR

If the trouble seems to be with the ATA, disable the ATA and replace it with a known working one.

Running a Maintenance session to test an ATA

1. Run a Maintenance session to ensure that the ATA is not disabled. (See Port/DN Status in the Maintenance chapter.)
2. Disable the port connected to the ATA using the heading 2.Port/DN Status.
3. Enable the port connected to the ATA using the heading 2.Port/DN Status.

Auxiliary ringer

1. If the auxiliary ringer is used for Service Modes (Night, Evening, or Lunch service), ensure that Service Modes is activated from the control telephone.
2. Check the wiring between the auxiliary ringer generator and the ringing device. Refer to the auxiliary ringer wiring chart.
3. Check the wiring between the auxiliary ringer generator and the distribution block:

Auxiliary ringer wiring

Feature	Pin
Auxiliary ring (Make)	44 (Yellow-Brown)
Auxiliary ring (Common)	19 (Brown-Yellow)

4. Ensure that the auxiliary ringer contacts are operating properly by checking with an ohmmeter across the auxiliary ringer pin contacts listed above.
5. Check that the auxiliary ringer pin contacts are programmed to operate in conjunction with any or all of the features in the auxiliary ringer programming chart.

Auxiliary ringer programming

Feature	Programmed in	
Auxiliary ringer: Lines	Configuration:	Line Data
Auxiliary ringer: Sets	Administration:	Telephone abilities
Service Modes	Administration:	Service Modes

The current capacity of the Norstar relay contacts is 50 mA DC. They are designed to operate with the auxiliary ringer generator, or equivalent.

External paging

1. Use the Button Inquiry feature (*) to verify the feature of a programmable memory button.
2. Check the wiring between the 50-pin connector and the paging amplifier or between the connections shown in the external paging wiring chart.

External paging wiring

Feature	Pin
Page out (Tip)	40 (Black-Slate)
Page out (Ring)	15 (Slate-Black)
Page (Make)	41 (Yellow-Blue)
Page (Common)	16 (Blue-Yellow)

3. Test external paging to ensure that it is working. The nominal output signal from the Norstar ICS is

775 mV across 600 Ω .

Music on Hold/Background Music trouble

Although Music on Hold and Background Music are separate features, they share the same wiring and customer-supplied music source.

1. Ensure that the proper feature access code () is turned on. Adjust the volume using the volume control bar.
2. Use the Button Inquiry feature () to verify the feature on a programmable memory button.
3. If there is trouble with Music on Hold, check 4. Call Handling in Configuration.

OR

If there is trouble with Background Music, check

5. Miscellaneous in Configuration.
4. Check the wiring between the music source and the 50-pin connector. See the wiring charts in the Installation chapter.
5. Ensure that the music source is turned on, is operational, and the volume control is set properly.
6. Any music source with a low-output impedance (for example, less than 3,300 ohms) can be connected. The output level must be less than one volt.

Problems with modules

Check first for user problems, then wiring and programming errors before replacing Norstar equipment.



Notify service provider of T1 signaling disruption

Notify your T1 service provider before disconnecting your T1 lines, removing power to your system, or performing any other action that disrupts your T1 signaling. Failure to notify your T1 service provider may result in a loss of T1 service.

Trunk Cartridge trouble

1. Check that the cartridge is properly inserted in the ICS or Trunk Module.
2. Run a Maintenance session to ensure that the cartridge is not disabled.

If the problem persists, follow as many of the next steps as required to solve the problem:

If the Trunk Cartridge is installed in the ICS:

1. If AC power is present and the LED indicator on the ICS is off, replace the ICS.

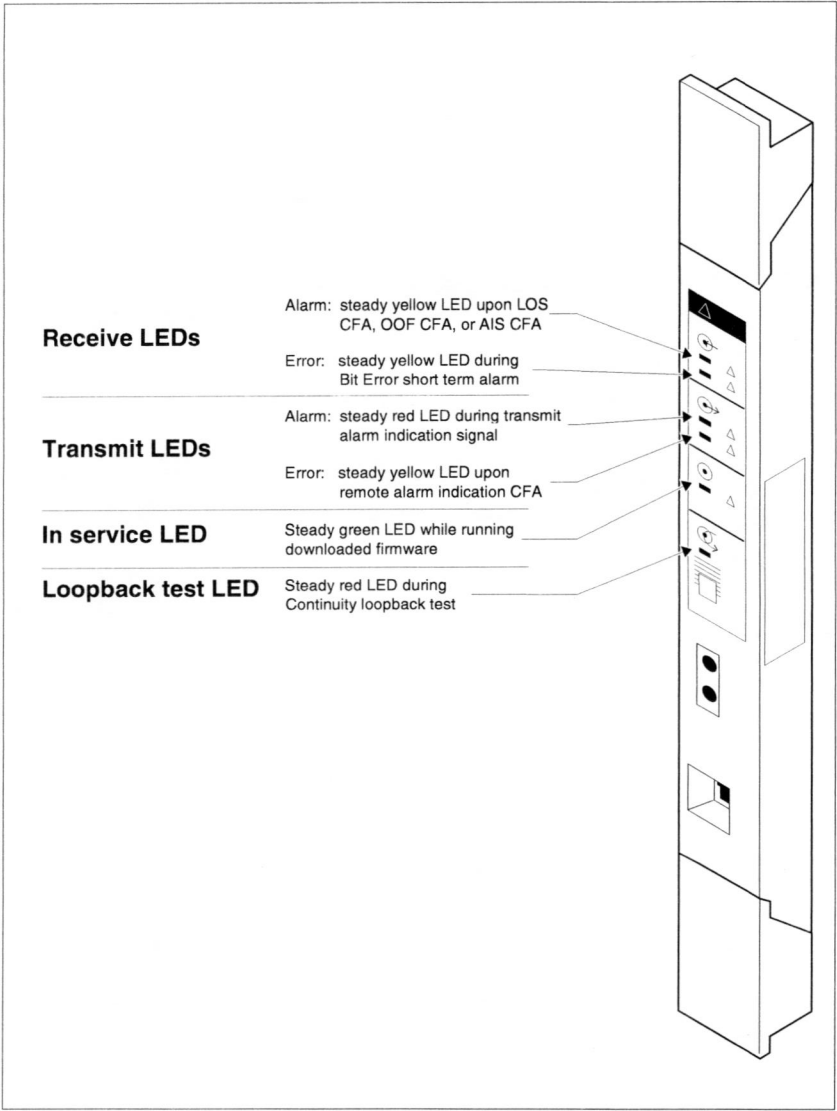
If the Trunk Cartridge is installed in a Trunk Module:

1. If AC power is present and the LED indicator on the Trunk Module is off, replace the Trunk Module.
2. Replace the fiber cable.
3. Replace the Trunk Cartridge.
4. Replace the Expansion Cartridge.
5. Replace the ICS.

Refer to the Installation chapter for information on replacing components.

Digital Trunk Interface trouble

- 1. Run a Maintenance session to verify that the Trunk Cartridge is enabled and that it's lines are provisioned.
- 2. Check the LEDs on the front of the DTI:



- **Receive Alarm:** yellow LED on indicates a problem with the digital transmission being received. This half-duplex link is unusable.
 - **Receive Error:** yellow LED indicates a minor error as a result of degraded digital transmission. Possible causes are an ohmic connection, water ingress, or too long a loop.
 - **Transmit Alarm:** red LED on indicates an inability to transmit. Alarm indication signal (AIS) is being transmitted to the terminating switch. This half-duplex link is unusable.
 - **Transmit Error:** yellow LED on indicates a remote alarm indication (RAI) carrier failure alarm (CFA) is being sent to the terminating switch. If the Transmit Alarm is not on, this indicates a far-end or cable problem.
 - **In service:** flashing green indicates that the T1 trunks are out of service because of a running loopback test, or because the DTI is being initialized.
 - **Loopback test:** red LED on while a continuity loopback test is running.
 - **All LEDs flashing continuously:** the DTI is being initialized.
3. Run a Maintenance session and any loopback tests as appropriate.
 4. Check the pinout of the cable that connects the DTI to the termination point from the T1 service provider or the external channel service unit, and check that the cable is properly connected.
 5. Check with your T1 service provider to see if through-fed repeaters are used on the T1 span. The DTI does not provide the DC connection required for through-fed repeaters. If through-fed repeaters are used on the T1 span, disable the internal CSU and connect the DTI to an external CSU.
 6. If the problem persists, replace the DTI.

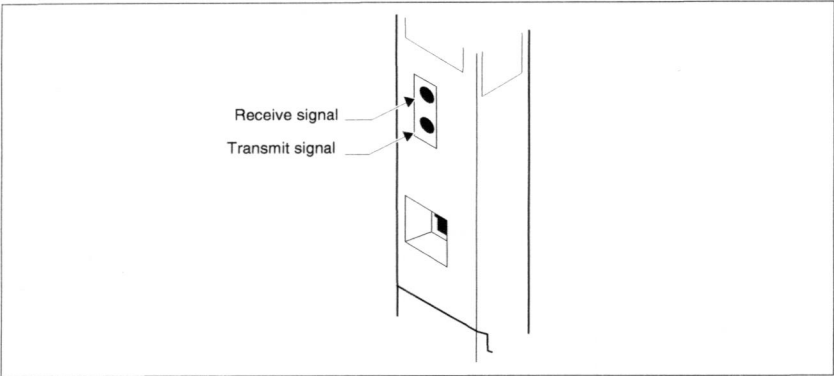
!

Notify service provider of T1 signaling disruption

Notify your T1 service provider before disconnecting your T1lines, removing power to your system, or performing any other action that disrupts your T1 signaling. Failure to notify your T1 service provider may result in a loss of T1 service.

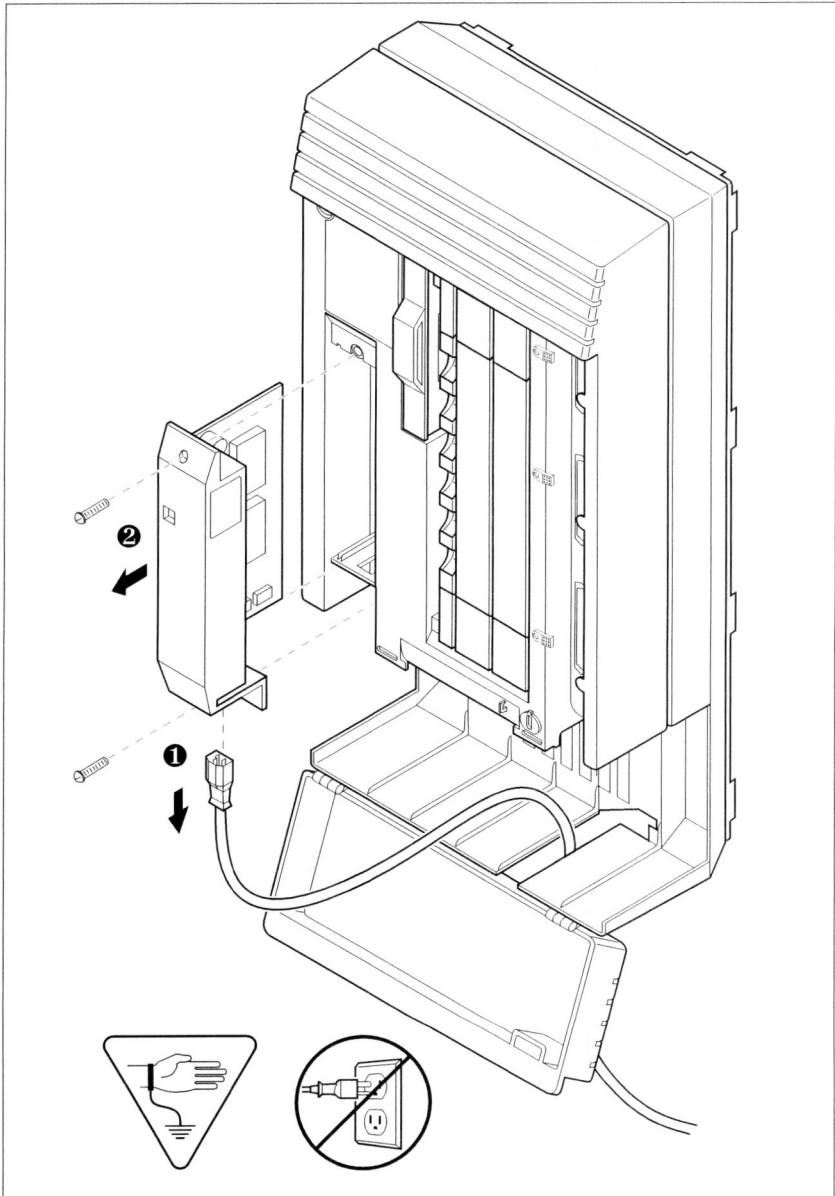
Monitoring the T1 signal

If you are finding minimal faults with the T1 signal, you can monitor the signal to try and isolate the problem. The monitor jack on the DTI faceplate provides non-intrusive, bridged in-service monitoring of the T1 signal. Connect a protocol analyzer or other test equipment into the monitor jack to monitor the signal received from the network, and the signal transmitted by Norstar.



ICS down

1. If AC power is present and the LED indicator on the ICS is off, replace the ICS power supply.



Trunk Module down

1. Run a Maintenance session to ensure that the Trunk Module is not disabled. (See the Maintenance chapter.)
2. Disable the module using the Maintenance heading
3.Module Status.
3. Enable the module using the Maintenance heading
3.Module Status.
4. Check the external line by terminating a single-line telephone directly on the distribution block, or equivalent, which connects to the Trunk Module.

If the problem persists, follow as many of the next steps as required to solve the problem:

1. If AC power is present and the LED indicator on the Trunk Module is off, replace the Trunk Module.
2. Replace the fiber cable.
3. Replace the Trunk Cartridge.
4. Replace the Expansion Cartridge.
5. Replace the ICS.

Refer to the Installation chapter for information on replacing components.

Station Module down

1. Run a Maintenance session to ensure that the module is not disabled. (See the Maintenance chapter.)
2. Disable the Station Module using the heading
3.Module Status.
3. Enable the Station Module using the heading
3.Module Status.
4. If the Station Module is still down, power down, then power up the ICS.

If the problem persists, follow as many of the next steps as required to solve the problem:

1. If AC power is present and the LED indicator on the Station Module is off, replace the Station Module.
2. Replace the Fiber cable.
3. Replace the Expansion Cartridge.
4. Replace the ICS.

Refer to the Installation chapter for information on replacing components.

Problems for network or remote users

Remote feature code gets no response

Possible problem

A Norstar user has called into another Norstar system and is trying to activate a remote feature but gets no response after dialing the feature code.

Solution

1. Make sure that the remote caller is dialing the feature code correctly. Use the asterisk (*) character, followed by the feature code, to activate a remote feature. (Do not use for accessing features on a remote Norstar system.)
2. Make sure that the remote user is dialing tones, not pulses once the call is answered.

Dialed number gets ringback and the wrong person

Possible problem

The digits sent by a switch at a central office or in the private network did not match any Received number, the Auto DN, or the DISA DN. The call has been routed to the prime telephone for the incoming trunk.

Solution

1. Verify that the switch is sending the correct number of digits for the Received number length defined in your system.
2. Verify all the digit strings that the switch should be sending.
3. Check that you have defined the corresponding Received number for every target line in your system.
4. Make sure that the published telephone numbers for your network are correct.

Dialed number gets stuttered dial tone instead of ringback

Possible problem

The remote caller has tried to reach a Norstar target line, but has reached a trunk with DISA instead. Alternatively, the Norstar system has mapped incoming digits onto the DISA DN.

Solution

1. Verify all the digit strings that the switch should be sending.
2. Check that you have defined a corresponding Received number for every target line in your system.
3. Check that you have defined the correct DISA DN for your system.
4. Make sure that the published telephone numbers for your network are correct.

Dialed number gets dial tone instead of ringback

Possible problem

The remote caller has tried to reach a Norstar target line, but has reached the Norstar system instead. Norstar has mapped the incoming digits onto the Auto DN.

Solution

1. Verify all the digit strings that the switch should be sending.
2. Check that you have defined the corresponding Received number for every target line in your system.
3. Check that you have defined the correct Auto DN for your system.
4. Make sure that the published telephone numbers for your network are correct.

Dialed number gets busy tone

Possible problem

The target line that the incoming digits map onto is busy, and there is no prime telephone for the incoming trunk.

Solution

1. For maximum call coverage, make sure that you configure a prime telephone for every incoming trunk.

Dialed number does not get through

Possible problem

The digits sent by a switch at a central office or in the private network did not match any Received number, the Auto DN, or the DISA DN. There is also no prime telephone assigned for the incoming trunk. In this case, the caller may hear overflow tone from the Norstar system or a recorded message from the originating switch.

Solution

1. Configure a prime telephone for every incoming trunk.
2. Verify that the switch is sending the correct number of digits for the Received number length defined in your system.
3. Verify all the digit strings that the switch should be sending.
4. Check that you have defined a Received number for every target line in your system.
5. Make sure that the published telephone numbers for your network are correct.

Possible problem

The Norstar system did not receive some or all of the incoming digits.

Solution

1. Check that the system hardware is receiving signals properly.
2. Verify that the switch is sending the correct number of digits for the Received number length defined in your system.
3. If the switch at the far end is sending pulse signals, make sure they are being sent at the proper rate. (Pulse digits must be 300 ms or more apart for Norstar to receive them.)

Possible problem

If remote callers are having difficulty getting through from the public network, there may be a problem with your DID Trunk Cartridge.

Solution

1. Connect a single-line DTMF telephone to a DID trunk input on the DID Trunk Cartridge.
2. Use the single-line telephone to enter a Received number that has been programmed for a target line in your system. Listen for ringback.
3. If you do not hear ringback, check that the target line is assigned to a telephone and that there is a prime telephone assigned for the DID trunk.
4. If you now hear ringback, but you also hear the noise of your unanswered call ringing, check the cross-connections. If all the cross-connections are correct replace the Trunk Cartridge.

Possible problem

If remote callers are having difficulty getting through from the private network, there may be a problem with your E&M/DISA Trunk Cartridge.

Solution

1. Check the cross-connections for the E&M/DISA Trunk Cartridge.
2. If the E&M trunks are connected to another Norstar system, make sure that connections have been made as indicated in the Technical data chapter.
3. Use the following table to check for correct voltage on the E&M/DISA leads:

Voltages on E&M leads

Leads	Voltage: active	Voltage: inactive
V _{T-R}	125 mV AC on steady dial tone	0 V AC
V _{T1-R1}	125 mV AC on steady dial tone	0 V AC
V _{E-SG}	0 V DC to -5 V DC	-48 V DC
V _{M-SB}	0 V DC to + 2 V DC	-48 V DC

Dialed DISA number gets ringback instead of stuttered dial tone

Possible problem

The remote caller has dialed a DISA number, but has instead reached a target line, or has been routed to the prime telephone for the auto-answer trunk. The Norstar system has mapped the incoming digits from a switch onto a target line, or has been unable to map the digits anywhere.

Solution

1. Verify that the switch is sending the correct number of digits for the Received number length defined in your system.
2. Verify all the digit strings that the switch should be sending.
3. Check that you have defined the correct DISA DN for your system.
4. Make sure that the published telephone numbers for your network are correct.

Dialed DISA number gets dial tone instead of stuttered dial tone

Possible problem

The remote caller has dialed a DISA number, but has reached the Norstar system instead. The Norstar system has mapped the incoming digits from a switch onto the Auto DN.

Solution

1. Verify that the switch is sending the correct number of digits for the Received number length defined in your system.
2. Verify all the digit strings that the switch should be sending.
3. Check that you have defined the correct DISA DN for your system.
4. Make sure that the DISA DN and Auto DN are different enough to prevent misdialing.
5. Make sure that the published telephone numbers for your network are correct.

DISA user gets overflow tone when entering COS password

Possible problem

The remote caller may have entered an invalid password.

Solution

1. Check the Administration programming under COS passwords and verify that the caller has a valid password.

Possible problem

The remote caller may have entered an asterisk (*) as one of the 6 digits.

Solution

1. Instruct remote callers to enter their COS password correctly: enter 6 digits.

Possible problem

The remote caller may have entered a number sign (#) as one of the 6 digits.

Solution

1. Instruct remote callers to enter their COS password correctly: enter 6 digits. The number sign (#) may be entered after the 6th digit, but is not required.

Possible problem

The remote caller may have waited more than 15 seconds between entering digits.

Solution

1. Instruct remote callers to enter their COS password correctly: enter 6 digits, and do not pause too long between digits.

Possible problem

The caller may be dialing from a rotary-dial telephone or from a push-button telephone that uses pulse signaling.

Solution

1. Inform remote callers that they must dial from a push-button telephone that uses DTMF "tone" signaling.

Dialed feature code gets overflow tone

Possible problem

The remote caller does not have access to that feature.

Solution

1. If the call came in on a trunk with DISA, check the Class of Service that is associated with the remote caller's COS password. If it is too restrictive, modify the remote package assigned to the COS password, or assign another COS password that is more suitable.
2. If the call came in on a trunk without DISA, check the remote package that you assigned to the incoming trunk. Make sure that it gives the appropriate access to the remote caller.

Possible problem

The feature code is not valid.

Solution

1. Make sure that remote callers have a correct listing of the features that are programmed for remote access.
2. Ensure that remote callers are dialing the feature code correctly. Press ☐ followed by the feature code to activate a remote feature.

Possible problem

The caller may be dialing on a rotary-dial telephone or on a push-button telephone that uses pulse signaling.

Solution

1. Inform remote callers that they must dial from a push-button telephone that uses DTMF "tone" signaling.

Dialed feature code gets busy tone

Possible problem

A resource that the remote feature uses may currently be in use. For example, a remote caller trying to use the paging feature would get a busy tone if the auxiliary speaker were being used at the time.

Solution

1. If repeated attempts to use the remote feature get busy tone, there may be a malfunction in a resource that the feature uses. Check that the remote feature hardware is functioning normally.

Line pool access code gets overflow tone**Possible problem**

If the published line pool access code is valid, the remote caller does not have access to that line pool.

Solution

1. If the incoming trunk answers with DISA, give the remote caller a COS password that permits access to that line pool.

OR

Change the remote package for the incoming trunk so that it permits access to that line pool.

OR

Give the remote caller a line pool access code that is permitted within the Class of Service on the incoming trunk.

Possible problem

If the published line pool access code is invalid, the system has attempted, without success, to match the invalid code to a Norstar target line internal number, and there is no prime telephone for the auto-answer trunk.

Solution

1. Make sure that the published line pool access codes are correct.
2. Check that the line pool access codes have been entered correctly under 4. Miscellaneous in Configuration programming.

Possible problem

The caller may be dialing from the network on a rotary-dial telephone or on a push-button telephone that uses pulse signaling.

Solution

1. Inform remote callers that they must dial from a push-button telephone that uses DTMF "tone" signaling.

Line pool access code gets ringback

Possible problem

The published line pool access code is invalid, and the system has routed the call to the prime telephone for the incoming trunk.

Solution

1. Make sure that the published line pool access codes are correct.
2. Check that the line pool codes have been entered correctly under 5. Miscellaneous in Configuration programming.

Line pool access code gets busy tone

Possible problem

There are not enough lines in the line pool to serve the number of users.

Solution

1. If the line pool contains loop start trunks, enter Configuration and move under-used loop start trunks from other line pools into the deficient line pool.

OR

If the line pool contains E&M trunks, order more trunks from the telephone company or private network vendor. Install additional E&M Trunk Cartridges. In Configuration programming, add the new trunks to the deficient line pool.

OR

Create a separate line pool for remote users only.

Possible problem

There are DID lines in the line pool.

Solution

1. In Configuration programming, make sure that there are no DID lines in any of the line pools.

Dialed number gets no response

Possible problem

The remote caller, after accessing a line in a line pool, may have started dialing before the far end was ready to receive digits.

Solution

1. Instruct remote callers to wait until they hear feedback before entering any digits.

Possible problem

There may be a malfunction in the line that the remote caller accessed.

Solution

1. If the problem is persistent, check that all lines in the affected line pool are functioning normally.

Possible problem

There may be a malfunction in the system that the caller is trying to reach.

Solution

1. Inform the operators of the system at the far end that the dialed number is not getting through.

Maintenance

Maintenance overview

A Norstar Maintenance session helps you diagnose problems that may occasionally arise within the Norstar system. Maintenance also includes settings to determine how the system will deal with T1 digital lines, and provides a means for provisioning and testing digital lines.

The Maintenance section of programming has ten headings.

- | | |
|-------------------|--|
| 1. System Version | displays the version number of the system processor. |
| 2. Port/DN Status | allows you to check and change the status of ports in your system. |
| 3. Module Status | allows you to check and change the status of modules in your system. |
| 4. Sys Test Log | displays a list of test results, event messages, and alarm codes. |
| 5. Sys Admin Log | displays a list of Configuration sessions, invalid password attempts and password changes. |
| 6. Network Log | displays a list of T1 events and alarms. |
| 7. Clock Source | allows you to select which DTI obtains the clock frequency from the T1 network. |
| 8. Provisioning | allows you to add or remove individual T1 lines from service. |
| 9. Loopback Tests | allow you to test incoming T1 signals to evaluate transmission quality. |
| 10. CSU Stats | displays T1 performance information supplied by the Channel Service Unit. |

You can run a Maintenance session from any working Norstar M7310 or M7324 telephone. Only one person at a time can access a Maintenance session. Photocopy the Maintenance records found at the end of this chapter, and keep a pencil handy to record important information.

Beginning a Maintenance session

1. Release all calls on your telephone.
2. Press * * which is the same as * * . The display reads **Password:.**
3. Enter the Installer password. The display reads **A. Configuration.** Three triangular indicators ► appear on the vertical display between the rows of buttons.
4. Place the programming overlay over the buttons pointed to by the indicators ►.
5. Press until the display reads **D. Maintenance.**

System Version

System Version allows you to note the version number of the System Processor (SP) software, which resides in the Feature Cartridge.

The SP version number can be used to determine whether you have the latest software release, and to trace a software fault if one occurs. For instance:

- SP version number can indicate a Feature Cartridge incompatibility.
- SP and telephone version numbers can indicate a telephone version incompatibility.
- SP and functional terminal version numbers can indicate a functional terminal incompatibility.

Checking the version of the system

To check the version number, start with the display reading D. Maintenance:

1. Press . The display reads 1.System Version.
2. Press . The display shows the version number of the SP.
3. Write the SP version number on the appropriate Maintenance record.
4. Press . The display reads 1.System Version.

Port/DN Status

Port/DN Status allows you to:

- identify any device or line connected to the system
- check the version number of a device (an Analog Terminal Adapter, for example) for compatibility with the system
- check the state of a device or line (for example, idle or busy)
- disable or enable a device
- determine which port number corresponds to each DN
- determine the port number of a malfunctioning device
- determine if a malfunctioning device is incompatible with the Norstar system
- disable a device before replacing it

Tips

You cannot disable the Norstar telephone from which you are accessing the Maintenance session. If you try to do this, a message appears on the display and you hear an error tone. If you want to disable that particular telephone, conduct the Maintenance session from another Norstar telephone.



Pick a suitable time to disable devices

Do not disable devices when many people are using the Norstar system. Wait until after regular office hours.

Do **not** enable or disable ports at the following times:

- during the first two minutes after Startup programming
- before fiber cables are connected

If you do so, incorrect ports may be enabled or disabled. To recover from this, disable then enable the affected modules using Module Status.

Port/DN Status allows you to check lines and devices on the system. Although the following procedures describe how to check devices, you can use the same procedures to check lines.

Lines can only be disabled in 3.Module Status.

Identifying a device connected to the system

Start with the display reading 1.System Version:

1. Press . The display reads 2.Port/DN Status.
2. Press . The display reads Show Port:.
3. Enter the port number of the device, or press DN, then enter the directory number of the device. The display shows device information, as illustrated in the following sample device identification display. This identifies the device connected to the B1 channel.
4. If there is an add-on device attached to a Norstar telephone such as a central answering position module or a Busy Lamp Field, press to display the add-on device.
5. Press B2 to display the device connected to the B2 channel.
6. Press until the display reads 2.Port/DN Status.

Displays

Sample device identification display

```
P104 7324 224
UESRN >B2 STATE
```

This sample display indicates that port 104 has an M7324 telephone whose DN is 224.

The following table lists some of the device types that may appear on the Norstar device identification display.

Explanation of device type

Display	Explanation
7100	M7100 telephone
7208	M7208 telephone
7310	M7310 telephone
7324	M7324 telephone
1: MODULE1	First CAP module attached to an M7324 telephone
2: MODULE2	Second CAP module attached to an M7324 telephone
ATA	Analog Terminal Adapter or Analog Station Module
BLF	Busy Lamp Field

Checking the version number of the device

From the Norstar device identification display:

1. Press VERSN (if it is available). The display shows the version number of the device.
2. Write this number on the appropriate Maintenance record.

To return to the Norstar device identification display from the display showing the version number:

1. Press OK to retain the same port number.
OR
Press to see information about the next port number (or DN if that is how you entered).
OR
Press to see information about the previous port number (or DN if that is how you entered).

Checking the state of the device

From the Norstar device identification display:

1. Press STATE. The display shows one of the states listed in the table on the following page.
If you want, you can disable or enable the device (see the procedures in this chapter).
2. Press OK to return to the device identification display.

How the device state is shown on the display

Display	State of device
Busy DISABLE OK	The device is in use.
Disabling... OK	The device is being disabled.
Enabling... OK	The device is being enabled.
Idle DISABLE OK	The device is not in use.
Unequipped DISABLE OK	There is no device connected to that port.
Disabled by user ENABLE OK	The device has been disabled by someone running a Maintenance session.
Disabled by sys. ENABLE OK	The device has been disabled by the system because it is faulty or because a test is running.
Not available DISABLE OK	There is no state available.

Disabling a device



Give notice that you are disabling equipment

Make sure you inform people that you are going to disable their devices.

To disable immediately when the display indicates the device is busy:

- 1. Press DISABLE. The display reads *Disable at once?*.
- 2. Press YES. The system prompts the device user and disables the device in one minute (or immediately, if the device is idle). Press EXIT to leave this display without disabling the device.

Displays

The following table show examples of the sequence of messages that might appear on a telephone when you disable a device.

Examples of display messages

Please hang up Maintenance test	Occurs on a busy telephone before disabling
48 seconds until disconnect	
Please hang up	
In Maintenance	Occurs after disabling

Enabling the device

When the display shows you that the device is disabled:

1. Press ENABLE. The display briefly reads Enabling... The device is immediately enabled and the display reads Idle.

Tips

The display may briefly read Enabling..., then either Disabled by sys. or Disabled by user. In this case, the system is waiting to enable the module. This may occur after someone has run a Maintenance session and used Module Status. You cannot enable the device until its module has been enabled.

Individual lines cannot be disabled in 2.Port/DN Status. To disable a Trunk Cartridge, see Module Status.

Returning to the beginning

From the display showing the state of the device:

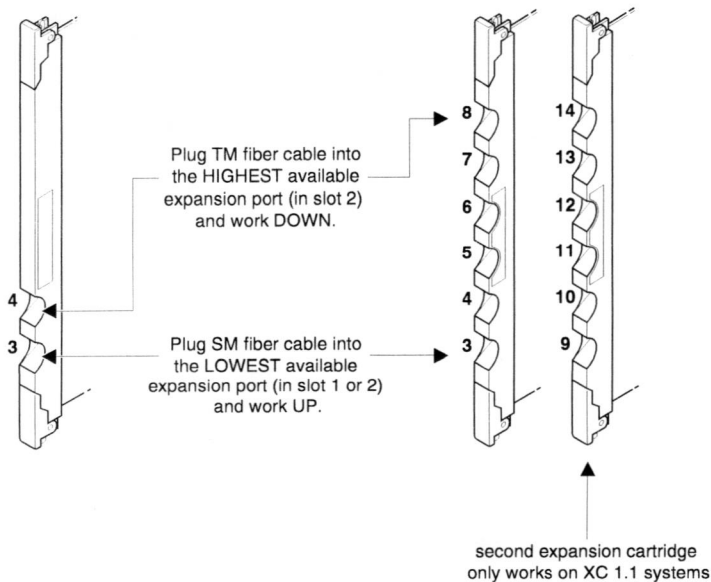
1. Press OK.
2. Press until the display reads 2.Port/DN Status.

Module Status

Module Status allows you to:

- look at the inventory of Station Modules, Trunk Modules, and modules inside the Integrated Communication System
- check the number of Trunk Cartridges in a module
- check the state of the module or its cartridges
- disable or enable the module or its cartridges
- isolate any malfunctioning modules
- disable a module before replacing it
- clear a hung line by disabling and enabling the affected Trunk Cartridge

Module numbering schemes for two-port, six-port and 12-port Expansion or Combo Cartridges



Tips

Modules 1 and 2 are located inside the ICS. Module 1 connects Norstar telephones. Module 2 connects Trunk Cartridges.

Looking at the module inventory

Start with the display showing 2.Port/DN Status:

1. Press . The display reads 3.Module Status.
2. Press . The display reads Show module:.
3. Enter the module number. Modules 1 and 2 are located inside the ICS. Refer to the figures on the previous page for the module numbering scheme.

If you choose module 1, the display shows how many telephones are on the ICS. If you choose module 2, the display shows the number of Trunk Cartridges connected to the ICS; the ICS is identified as Mod 02.

If you are checking a Trunk or Station Module, the display shows either how many Trunk Cartridges are connected to the Trunk Module or how many devices are connected to the Station Module.

Tips

Norstar devices may occupy both the B1 and B2 channels. This may increase the number of devices indicated on the module inventory display.

The display is different for Analog Station Modules (ASM) and will read either 8 sets on ASM or 16 sets on ASM.

Checking the number of Trunk Cartridges attached to a module

Start from the module inventory display, which shows the number of Trunk Cartridges connected to the module you chose (for example, Mod 04: 3 cards).

1. Press TC. If there is a Trunk Cartridge in a slot, the display shows that four lines are connected (for example, Card 1: 4 lines).
2. Press or to check for Trunk Cartridges in the other slots.

- 3. Press MODULE to return to the module inventory display.

Checking the state of a module

Start from the module inventory display, which shows the number of Trunk Cartridges connected to the module you chose (for example, Mod 04: 3 cards).

- 1. Press STATE. The state of the module is shown on the display.
- 2. Press OK to return to the module inventory display.

How the module or cartridge state is shown on the display

Example display	State of module or cartridge
3 sets busy DISABLE OK	There are three devices in use that are connected to the module or cartridge.
2 ports busy DISABLE OK	There are two ports in use that are connected to the module or cartridge.
4 lines busy DISABLE OK	There are four lines in use that are connected to the module or cartridge.
Disabling... OK	The module or cartridge is being disabled.
Enabling... OK	The module or cartridge is being enabled.
Unequipped DISABLE OK	There is no module or cartridge connected to that DS-30 port.
Disabled by user ENABLE OK	The module or cartridge has been disabled from a Maintenance session.
Disabled by sys. ENABLE OK	The module or cartridge has been disabled by the system because it is faulty or because there is a test running.
Updating state...	The system is verifying the state of the module or cartridge.

Checking the state of a cartridge

Start from the display that shows the number of lines connected to the Trunk Cartridge you chose (for example, Card 1: 4 lines).

1. Press STATE. The display shows the state of the cartridge. Some examples of this display are shown on the previous page.
2. Press or to check the Trunk Cartridges connected to the other Trunk Modules.
3. If required, you can disable or enable the cartridge. (See the procedures in the following two sections.)
4. Press OK to return to the display showing how many lines are connected to the Trunk Cartridge.

Disabling a module or its cartridges



Use Page feature prior to disabling

Use the Page feature to inform people that you are about to disable a module. Mention that they may experience delays in the performance of their devices.

From the display showing the state of the module or cartridge:

1. Press DISABLE. The display reads Disable at once?.
2. Press YES. The system disables the module or cartridge in one minute (or immediately, if the status is idle). Press EXIT to leave this display without disabling the module or cartridge.

Enabling a module or its cartridges

From the display showing the state of the module or cartridge:

1. Press ENABLE. The display briefly reads Enabling.... The module or cartridge is immediately enabled. The display then shows the state of the module or cartridge.

Returning to the beginning

From any display showing the state of the module or cartridge:

1. Press OK.
2. Press until the display reads 3.Module Status.

System Test Log

The System Test Log shows you a list of diagnostic test results, audits, event messages, and alarm codes. By using this feature you can:

- check the items in the log
- check the current alarm (if there is one)
- check when each item in the log occurred
- check the number of consecutive occurrences of an event or an alarm
- erase the log

The System Test Log holds a maximum of 20 items. You should check and record these items at regular intervals. Erase the log after dealing with all the items.

Checking the items in the log

Start with the display reading **3.Module Status**:

1. Press . The display reads **4.Sys Test Log**.
2. Press . The display reads **Start of new log**. (If there is no log entry, the display reads **Log is empty** and returns to **4.Sys Test Log**.)
3. Press or . The display shows a log item.
4. Write down the item on the System Test Log record.
5. If the log item is an event message or an alarm code, refer to the Event messages section or the Alarm codes section in this chapter.
6. Repeat steps 3, 4, and 5 until you have recorded all the items.

Checking the current alarm

If you want to quickly check the highest severity alarm before viewing all the log items, start with the display reading *Start of new log* or *Start of log*:

1. Press ALARM. The display shows an alarm code if there is a current alarm.
If there is no current alarm, the display reads *No current alarm* and then *Start of new log* or *Start of log*.
2. Press OK to return to the display *Start of log*.

All alarms are recorded as items in the System Test Log.

Checking when each item in the log occurred

Start with any display showing a log item:

1. Press TIME. The display briefly shows the date and time.
2. Write the date and time on the System Test Log record.

Checking the number of consecutive repetitions of an event or alarm

If REPEAT appears under a display showing a log item:

1. Press REPEAT. The display shows the number of consecutive times the event or alarm occurred.

Erasing the log

Start with the display reading *Start of new log* or *Start of log*:

1. Press ERASE. The display reads *Erase log?*.
2. Press YES.
If no new items have been added since the list was entered, the log is erased and the display reads *Log is empty*.
OR
If new items have been added since the list was entered, the display reads *Log has changed*.
3. If the display reads *Log has changed*:
Press SHOW show the new log.
OR
Press EXIT to return to 4.Sys Test Log.

System Administration Log

The System Administration Log keeps a record of administrative events such as Configuration sessions in which a change was made, invalid password attempts, and password changes. By using this feature you can:

- check the items in the log
- erase the log
- check when each item in the log occurred

The System Administration Log holds a maximum of ten items. Erase the log after dealing with all the items.

Checking the items in the log

Start with the display reading **4.Sys Test Log**:

1. Press . The display reads **5.Sys Admin Log**.
2. Press . The display reads **Start of new log**.
(If there is no log entry, the display reads **Log is empty** and returns to **5.Sys Admin Log**.)
3. Press or . The display shows a log item.
4. Write down the item on the System Administration Log record.
5. Repeat steps 3 and 4 until you have recorded all the items.

Checking the current alarm

Start with the display reading **Start of new log** or **Start of log**:

1. Press **ALARM**. The display shows an alarm code if there is a current alarm. If there is no current alarm, the display reads **No current alarm** and then reads **Start of log**.
2. Press **OK** to return to the display showing **Start of log**.

Checking when each item in the log occurred

Start with any display showing a log item:

1. Press **TIME**. The display shows the date and time.
2. Write the date and time on the System Administration Log record.

Erasing the log

Start with the display reading **Start of new log** or
Start of log:

1. Press ERASE. The display reads **Erase log?**.
2. Press YES. If no new items have been added since the list was entered, the display reads **Log is empty**.

OR

If new items have been added since the list was entered, the display reads **Log has changed**.

3. If the display reads **Log has changed**, press SHOW to show the new log.

OR

Press EXIT to return to **5.Sys Admin Log**.

Network Log

The Network Log keeps a record of events and alarms that are specific to the T1 network interface. You can:

- check the items in the log
- erase the log
- check when each item in the log occurred

The Network Log holds a maximum of twenty items. Erase the log after dealing with all the items.

Checking the items in the log

Start with the display reading **5.Sys Admin Log**:

1. Press . The display reads **6.Network Log**.
2. Press . The display reads **Start of new log**.
(If there is no log entry, the display reads **Log is empty** and returns to **6.Network Log**.)
3. Press or . The display shows a log item.
4. Write down the item on the Network Log record.
5. Repeat steps 3 and 4 until you have recorded all the items.

Checking the current alarm

Start with the display showing **Start of new log** or **Start of log**:

1. Press **ALARM**. The display shows an alarm code if there is a current alarm.
If there is no current alarm, the display reads **No current alarm** and then **Start of log**.
2. Press **OK** to return to the display **Start of log**.

Erasing the log

Start with the display reading **Start of new log** or
Start of log:

1. Press ERASE. The display reads **Erase log?**.
2. Press YES. If no new items have been added since the list was entered, The display reads **Log is empty**.

OR

If new items have been added since the list was entered, the display reads **Log has changed**.

3. If the display reads **Log has changed**, press SHOW to show the new log.

OR

Press EXIT to return to 6. Network Log.

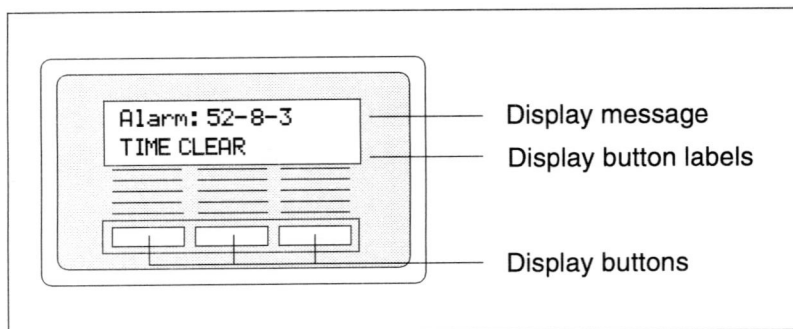
Checking when each item in the log occurred

Start with any display showing a log item:

1. Press TIME. The display shows the date and time.
2. Write down the date and time on the Network Log record.

Alarm codes

The Norstar ICS system generates alarm codes after system disconnections or after certain anomalies in system operation. All alarm codes appear at the Alarm telephone and in the System Test Log of a Maintenance session. For a complete description of alarm and event codes, you may order an *Alarm and Event Code Manual* from your service provider. The following figure shows an alarm code appearing on a Norstar Alarm telephone display.



Tips

The Alarm telephone is assigned in 5. Miscellaneous of Configuration programming.

Alarms have a higher severity than events. Attend to alarm codes before event messages.

Alarm code information that is specific to Companion components is included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

If you see an alarm code

1. Write the alarm code on the System Test Log record.
2. Determine the cause of the alarm from the following table.
3. Follow Alarm troubleshooting procedures in this chapter.
4. Press TIME to see when the alarm occurred.
5. Press CLEAR to clear the alarm.

An alarm code may not be displayed until two minutes after it has been triggered. If the ICS is powered off when the alarm is triggered, the alarm code is not displayed until two minutes after the ICS is powered on.

For a complete list of Norstar alarms, consult the *Norstar Alarm & Event Code Manual*.

Displays

Example display	Meaning	Possible causes
Alarm: 10	All ICS devices disconnected.	The last device on Norstar bus 1 (port numbers 101-124) has been removed. A 25-pair cable was disconnected from the ICS. There is an internal ICS fault.
Alarm: 40 Alarm: 41 Alarm: 42 Alarm: 43 Alarm: 44 Alarm: 45 Alarm: 46 Alarm: 47	There is a problem with the T1 signal	The cable connecting the DTI to the network termination point or external CSU has been disconnected. There is a problem with the T1 signal from the network.
Alarm: 50-X	All devices on SM disconnected.	The last device on Norstar bus X (port numbers X01-X16) has been removed. The 25-pair cable was disconnected from the SM. The fiber cable from the SM to the ICS has been disconnected. The SM was powered down.
Alarm: 51-X	Trunk Module disconnected.	All Trunk Cartridges have been disconnected from the TM on DS-30 port X. The TM was powered down. The fiber cable from the TM to the ICS has been disconnected.

Alarm: 52-X-Y	TC disconnected from TM	Trunk Cartridge Y on DS-30 port X has been disconnected from the TM.
Alarm: 61-X-Y	Incompatible Trunk Cartridge	Trunk Cartridge Y on DS-30 port X cannot operate with the Trunk type assigned to it in Configuration.
Alarm: 62-X-Y	Unsupported Auto-answer setting (Loop Start TCs)	Trunk Cartridge X on DS-30 port Y does not support the auto-answer setting.
Alarm: 63-Z	No available DTMF receivers	DTMF receivers are busy, not working properly, or have not been installed.
Alarm: 68-Z	A device has been connected to a port which is not available for the device type.	Power down the system and disconnect the device from the port identified. Reconnect it to a valid port.

"X" = DS-30 port number (1-8)

"Y" = Trunk Cartridge number (numbered from left to right)

"Z" = Trunk port number

Alarm troubleshooting

Refer to the previous table before following these procedures.

Alarm: 10

1. Check to see if there is a device connected to the ICS (that has a port number beginning with the number "1").
2. If there are no devices connected to the ICS, connect one and then press **CLEAR**.
3. If there are any devices connected to the ICS, check all the wiring associated with the devices.
4. Refer to the section in the Troubleshooting chapter entitled ICS down.

Alarm: 40 to Alarm: 47

1. Check the System Network Log for events in the range 315-336 to verify the frequency of the alarms.
2. Refer to Digital Trunk Interface trouble in the Troubleshooting chapter.

Alarm: 50-X

1. Check that there is a device connected to the Station Module (that has a port number beginning with a number from three to eight).
2. If there are no devices connected to the Station Module, connect one and then press CLEAR.
3. If there are any devices connected to the Station Module, check all the wiring associated with the devices.
4. Refer to the section in the Troubleshooting chapter entitled Station Module down.

Alarm: 51-X

1. Check the wiring from the ICS to the TM.
2. See Trunk Cartridge trouble in the Troubleshooting chapter.
3. Refer to Trunk Cartridge trouble in the Troubleshooting chapter.

Alarm: 52-X-Y

1. Follow the procedure in Trunk Cartridge trouble in the Troubleshooting chapter.
2. If the problem persists, replace Trunk Cartridge Y on DS-30 port X. (Refer to the previous table for the definition of "X" and "Y").

Alarm: 61-X-Y

1. Check that the proper Trunk Cartridges are inserted in the proper slots of the ICS or Trunk Module.
2. Enter Configuration programming and look under the 1. Trk/Line Data heading. Check that the Trunk Cartridge type is correctly configured. Check that the Trunk mode and Answer mode settings do not conflict for every line connected to Trunk Cartridge Y. If Trunk mode is set to unsupervised, Answer mode must be set to manual.

OR

Install a Trunk Cartridge in slot Y that matches the type of trunk you have configured.

Alarm: 62-X-Y

1. Check that the proper Trunk Cartridges are inserted in the proper slots of the Trunk Module.
2. Enter Configuration programming and look under the 1. Trk/Line Data heading. Check that the Trunk mode and Answer mode settings do not conflict for every line connected to Trunk Cartridge Y. If Trunk mode is set to unsupervised, Answer mode must be set to manual.

Alarm: 63-Z

1. Check that you have the required E&M Trunk Cartridges (maximum of one for every two auto-answer loop start lines installed in a Trunk Module).
2. Enter Configuration programming and look under the 1. Trk/Line Data heading. Check that the Answer mode is correct for all the loop start lines.
3. Make sure that all of your E&M trunks installed in a Trunk Module are configured as E&M or DTMF (whichever applies) so that the system knows the receivers are there.
4. If the problem persists, an E&M Trunk Cartridge may be malfunctioning. Replace one E&M Trunk Cartridge at a time until the problem is resolved.

Alarm 68-Z

1. Locate the device(s) that has/have been connected to port(s) not available for that device type.
2. Power down the system.
3. Disconnect the device from the port identified.
4. Reconnect it to a valid port.

Event messages

Event messages appear as items in the System Administration Log or the System Test Log of the Maintenance session. Most of these event messages can only be caused by an unusual combination of events, and should rarely occur.

Each event is assigned a severity number. An "S" preceding this number, "S4" for example, may appear in the event message. "S8" is the most severe. If the Log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, you should check event messages at regular intervals. You can then deal with all messages before they are replaced.

Event message information that is specific to Companion components is included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

For a complete list of Norstar events, consult the *Norstar Alarm & Event Code Manual*.

Dealing with event messages

For every event message that you see:

1. Record the event on the appropriate Maintenance record.
2. Consult the next section entitled Significant event messages.
3. To see if the event caused the Norstar system to automatically restart, consult the subsequent section entitled Complete list of event numbers.

Significant event messages

The table on the next page lists event messages that are relevant to Maintenance activities. The time that the message is recorded is also provided.

Displays

Event message	The event message is recorded when...
Evt.:210-YYYZ S4	Loopback test YYY on Trunk Cartridge Z has been started
Evt.:211-YYYZ S4	Loopback test YYY on Trunk Cartridge Z has been stopped
Evt.:220-3546 S4	the System Administration Log has been cleared by the DN (3546 in this case)
Evt.:221-3546 S4	the System Test Log has been cleared by the DN (3546 in this case)
Evt.:222-3546 S5	the DN (3546 in this case) enters the debugging facility that is password protected
Evt.:255 S9	administered mode is not supported by the cartridge plugged into the slot
Evt.:260-0302 S8	the ICS takes the access line on port 0302 out of service because no current was detected
Evt.:261-0302 S1	the access line on port 0302 is returned to service after current was detected (see Evt.:260)
Evt.:263-302 S8	the ICS takes the E&M line on port 302 out of service because the far end did not respond to a disconnect signal
Evt.:264-302 S1	the E&M line on port 302 is returned to service after the far end finally responded to a disconnect signal (see Evt.:263)
Evt.:265-302 S7	the E&M line on port 302 did not receive an expected wink signal or delay dial signal from the far end
Evt.:268-07 S8	Dialing filter 07 has lost data due to a fault in the system memory
Evt.:269-3546 S8	the Line/set filter for the DN (3546 in this case) has lost data due to a fault in the system memory
Evt.:299 S1	the system powers up after a power failure
Evt.:400 S9	Startup programming is performed using Feature * S T A R T U P

Event message		The event message is recorded when...
Evt:407	S2	there are no more codes for Speed Dial numbers
Evt:408	S2	there is no more memory for Speed Dial codes
Evt:412-3546	S5	the Installer password has been changed by the DN (3546 in this case)
Evt:413-3546	S3	the Administration password has been changed by the DN (3546 in this case)
Evt:414-3546	S5	an invalid Installer password has been entered by the DN (3546 in this case)
Evt:415-3546	S3	an invalid customer password has been entered by the DN (3546 in this case)
Evt:416-3546	S4	Configuration programming is performed using Feature * * C O N F I G
Evt:417-3546	S2	Administration programming is performed using Feature * * A D M I N
Evt:418	S7	a DN change is successful
Evt:419	S2	the time setting has been changed
Evt:421	S8	a DN change failed
Evt:422-3546	S6	a length change by the DN (3546 in this case) has been requested
Evt:423-3546	S6	an individual DN change has been requested by the DN (3546 in this case)
Evt:441	S2	a timeout occurred while waiting for ANI or DNIS digits to be received
Evt:442	S5	a timeout occurred while waiting for ANI or DNIS digits to be received
Evt:822	S8	Alarm code 63 is sent because there are no DTMF receivers for an incoming call
Evt:883	S4	an invalid dial pulse signal was received by the DTI

Displays

You should rarely see any event messages that are not described in the section entitled Significant event messages. If you do see one of these event messages, the Norstar system has followed its normal recovery from an unusual combination of system events. Although the problem is not a serious one, repeated occurrences of the event number should be reported as soon as possible.

As a result of some events, the Norstar system automatically restarts itself. The table on the next two pages lists all the event numbers and tells you which of these events are associated with Norstar system restarts.

Most of these events are recorded in the System Test Log. The few exceptions to this are recorded in the System Administration Log, as indicated.

Event Message	System Restart	Event Message	System Restart
101-106	Yes	285-298	Yes
107	No	299	No
108-112	Yes	400 (Admin log)	Yes
113	No	401-403	No
114-116	Yes	405-411	No
117	No	412-419 (Admin log)	No
118-120	Yes	421-423 (Admin log)	No
121-123	No	424-425	No
124-125	Yes	426-430	Yes
126-129	No	431	No
130	Yes	432	Yes
131-132	No	433	No
133-134	Yes	441-442	No
135-136	No	600-602	Yes
137	Yes	603-613	No
138-150	No	614	Yes
151	Yes	615-629	No
152	No	630	Yes
160-164	No	631-646	No
170-173	No	800-802	No
200-211	No	803	Yes
220 (Admin log)	No	804-807	No
221-222	No	808	Yes
223 (Admin log)	Yes	809	No
224	Yes	810	Yes
225-228	No	811-820	No
229 (Admin log)	Yes	823	Yes
230-235	No	824-825	No
245-248	No	883	No
250-256	No	900	No
260-271	No	940-943	No
280-283	No	950-989	No

Clock Source

Systems with digital interfaces need to synchronize to the network in order to function. Synchronization is done in a hierarchical way, where each device/switch obtains the network clock from the device/or switch above it in the synchronization hierarchy and passes the network clock to the device/switch below it in the synchronization hierarchy. The synchronization levels are referred to as strata.

Norstar systems are stratum 4E equipment and are usually used as termination points in a network.

7.Clock Source lets you designate which of the systems Digital Trunk Interfaces (DTIs) obtains the timing reference from the network, which the system synchronizes to. For each DTI, choose one of the following settings:

Primary reference

The DTI obtains the timing reference from the network, which the system synchronizes to. This is the default value for the DTI in slot 4 in the ICS.

Secondary reference

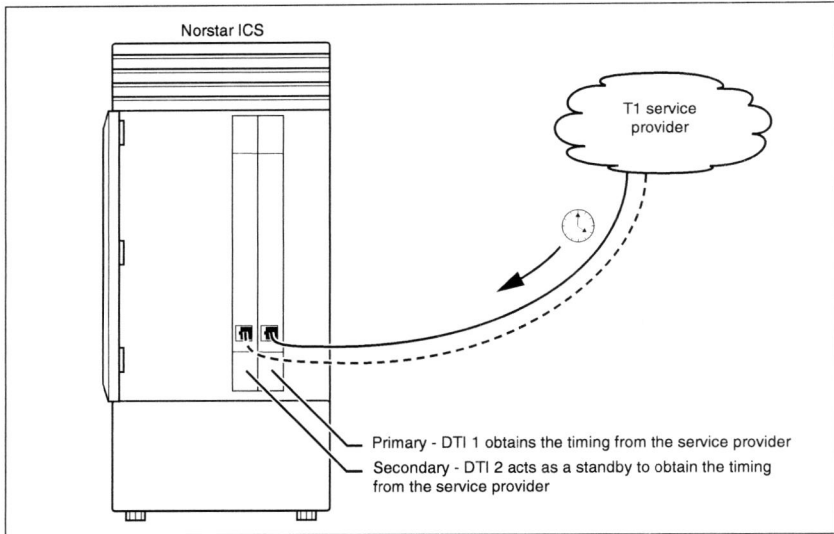
The DTI acts as a standby reference. If there are excessive errors on the primary reference T1 link, or the DTI designated as primary reference fails, this DTI will obtain the timing reference from the network, which the system synchronizes to. This is the default value for the DTI in slot 3 in the ICS.

Timing master

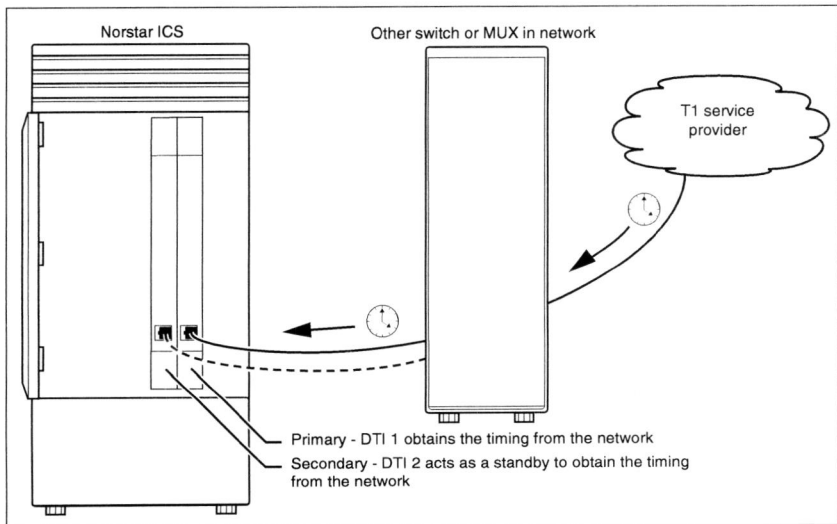
The DTI does not obtain timing from the network, but transmits the systems timing to equipment connected to it.

The following illustrations show some typical network configuration and the appropriate clock source settings for your DTIs.

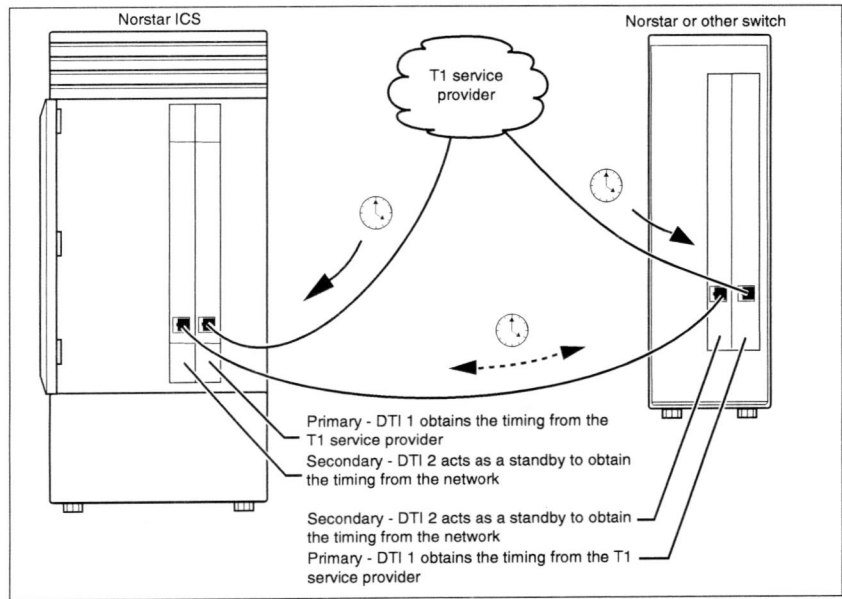
Norstar connected directly to the T1 service provider in a T1 network



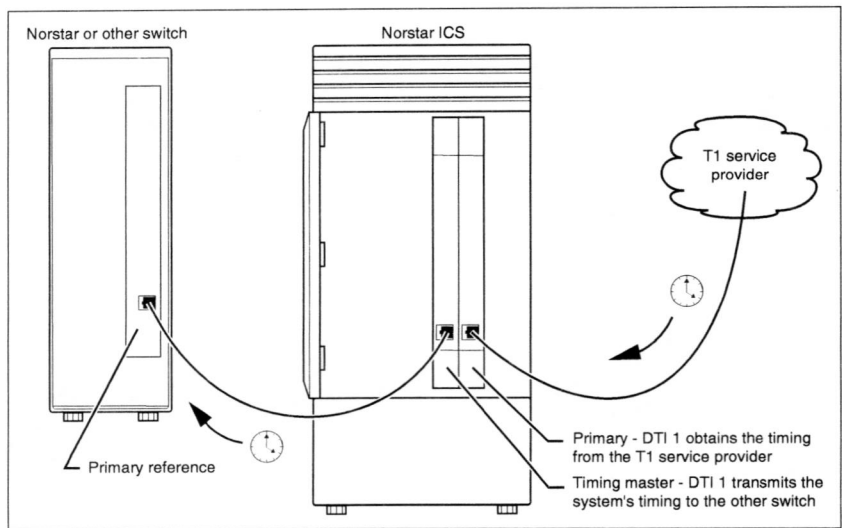
Norstar connected to another switch or MUX in a T1 network



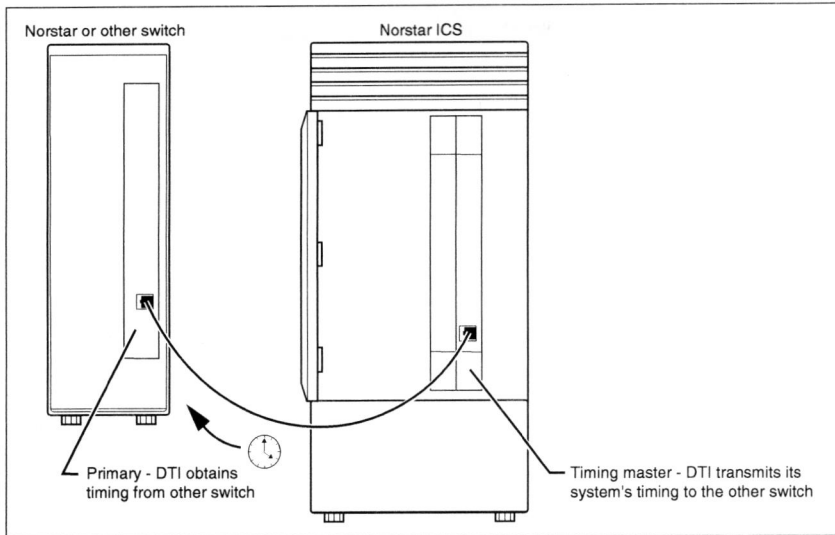
Norstar connected to another switch in a closed T1 network



Norstar connected in a series of switches in a T1 network



Norstar connected by a T1 link to another switch in an analog network



Setting the clock source for your DTIs



Changing clock source may disconnect calls

Changing the clock source for your system may cause your system to restart itself, resulting in dropped calls. Choose a suitable time to change the clock source and use the Page feature to inform people of possible service disruptions.

Start with the display reading **D. Maintenance**.

1. Press . The display reads **1.System Version**.
2. Press until the display reads **7.Clock Source**.
3. Press . The display shows the clock source setting for the first DTI (slot 4).
4. Press CHANGE to toggle the setting.
5. Press to change the setting for the second DTI (slot 3).
6. Press to exit or to continue in Maintenance.

Tips

In most T1 network configurations, you need one DTI in your ICS to act as a primary reference. The only application where you might not have a DTI designated as primary reference is in an analog network where your Norstar system is connected back-to-back with another switch using a T1 link. If the other switch is loop-timed to your Norstar system, your DTI can be designated as a timing master.

If your Norstar system has two DTIs, you cannot assign both DTIs as primary reference or both DTIs as secondary reference. You can only have one primary reference and one secondary reference per system.

For more information on network synchronization, consult the appropriate private digital network synchronization standards.

DTI Provisioning

Provisioning adds or removes individual T1 lines from service. T1 lines can be pre-provisioned even though the system is not equipped with a DTI.

Provisioning a line

Start with the display reading 7.Clock Source.

1. Press . The display reads 8.Provisioning9.
2. Press . The display reads Show line:.
3. Enter the number of the line to be provisioned. The display shows the line and its current status.
4. Press PORT to identify the logical port number for the line. Lines cannot be provisioned from the PORT display. Press LINE to return to the line number display.
5. Press to view settings for the next line number.
6. Press until you return to 8.Provisioning9.

Deprovisioning a line

Deprovisioning all of the lines on a DTI does not disable the cartridge.

Start with the display reading 7.Clock Source.

1. Press . The display reads 8.Provisioning9.
2. Press . The display reads Show line:.
3. Enter the number of the line to be deprovisioned. The display shows the line and its current status.
4. Press REMOVE to deprovision the line. If the line is in use, the display reads Busy: Remove now?. Press YES to deprovision the line in 60 seconds, or CANCEL to leave the line provisioned.
5. Press to view settings for the next line number.
6. Press until you return to 8.Provisioning9.

Loopback Tests

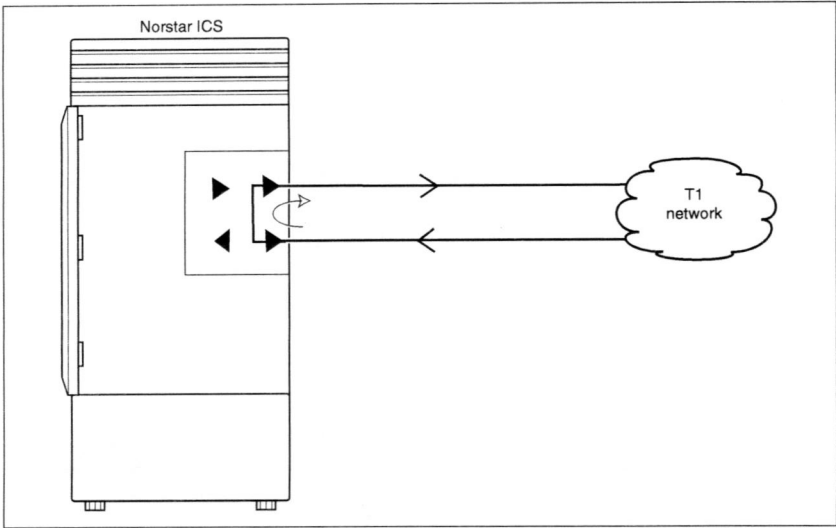
Norstar allows you to run four loopback tests to evaluate different aspects and segments of the T1 digital transmission path. You can only run one loopback test at a time on any one DTI.

Tips

The following messages may appear on the Alarm Telephone during Loopback tests.

Message	Explanation
EVT: 210-YYYZ	Loopback test YYY on Trunk Cartridge Z has started
EVT: 211-YYYZ	Loopback test YYY on Trunk Cartridge Z has ended

Line loopback

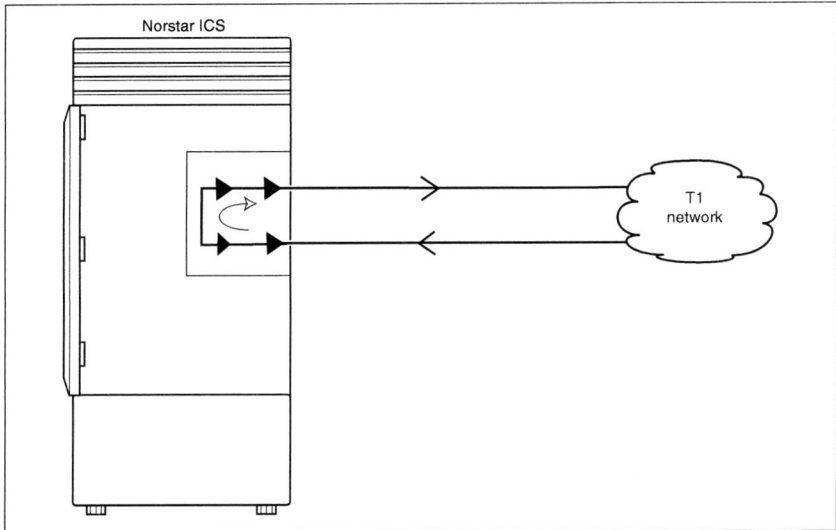


The line loopback test loops the full 1.544 Mbps signal received from the network back to the network. The looped signal is regenerated without any change in the framing format and without the removal of any bipolar violations. The line loopback test can also be invoked and stopped remotely using the in-band signal or via the facility data

link (FDL) in extended super frame (ESF) format.

The line loopback test must be run in coordination with the T1 service provider. Some test patterns can cause the DTI to reset. To avoid this, start the line loopback test from your system before the T1 service provider begins their test, and stop the line loopback test from your system after the T1 service provider ends their test.

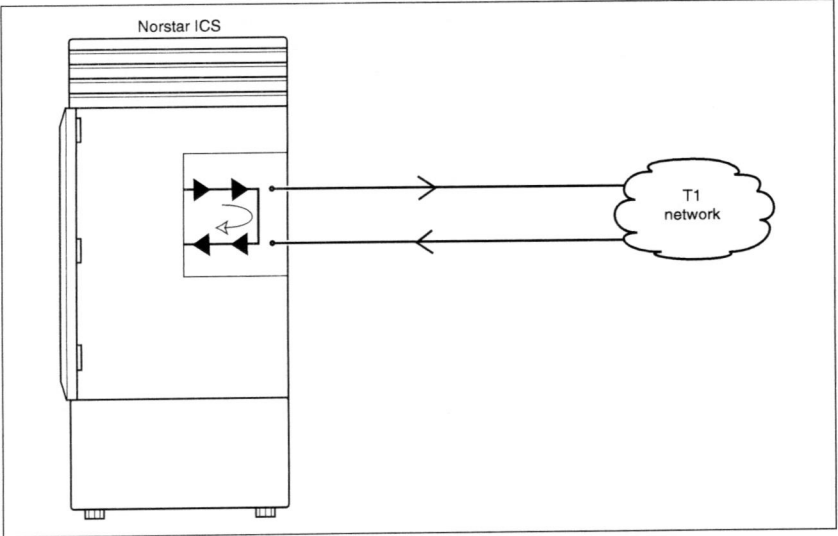
Payload loopback



The payload loopback test loops the received information bits (192 per frame) back to the network. The payload loopback test can also be invoked and stopped remotely via the facility data link (FDL) in extended super frame (ESF) format.

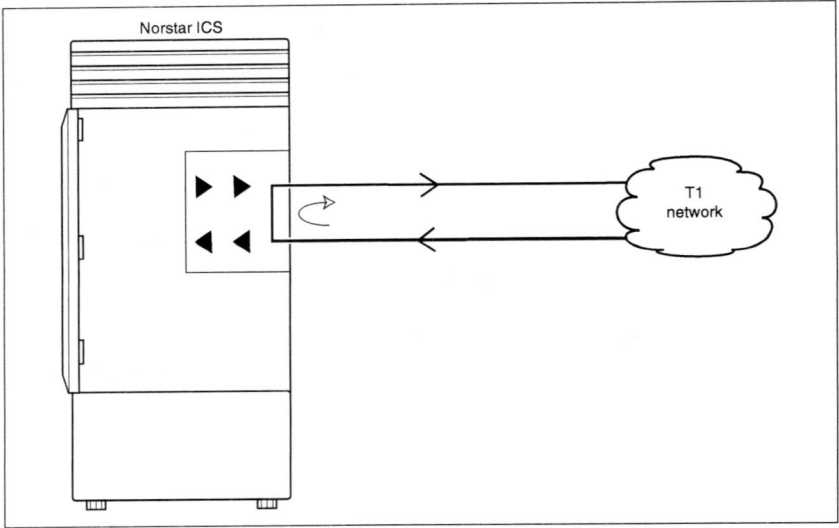
The payload loopback test must be run in coordination with the T1 service provider. Some test patterns can cause the DTI to reset. To avoid this, start the payload loopback test from your system before the T1 service provider begins their test, and stop the payload loopback test from your system after the T1 service provider ends their test.

Card edge loopback



The card edge loopback test loops the outgoing signal on the DTI back to its internal received signal path. Signal paths to the external network are disconnected.

Continuity loopback



The continuity loopback test shorts the tip and ring pair of the receive signal path with the transmit signal path. This test allows you to check the metallic continuity of the external wiring.

Tests initiated from Norstar

Loopback tests, except for the continuity test, are started and stopped in Maintenance programming under the heading 9. Loopback Tests. The continuity test is started and stopped using a button on the DTI faceplate.

Only one test at a time can be run on a trunk cartridge. You can exit Maintenance, or move on to another programming task while the loopback test is running. While the loopback test is running, the green "in Service" LED on the DTI flashes.

Tests initiated by the central office

If the internal CSU is administered on line loopback and payload loopback tests can also be invoked and stopped by the central office. In order to be able to run a payload loopback test, the DTI must be configured for extended superframe format.



Choose an appropriate time to run tests

Do not run the loopback tests while ports are being disabled or during the first two minutes after Startup programming. If you do, the tests may stop running with ports still disabled. To recover from this, unplug the ICS from the power outlet, then plug it in again.

The loopback tests disrupt service. Do not run tests when many people are using the Norstar system.

Starting a line, payload or card edge loopback test



Give notice that you are running a loopback test

Calls on all T1 lines on the DTI will be automatically dropped when a loopback test is invoked. Use the Page feature to notify people using the system that a test is about to begin and that calls will be disconnected.

Start with the display reading 8.Provisioning:

1. Press . The display reads 9.Loopback Tests.
2. Press . The display reads Test:TC1 on KSU.
3. Press CHANGE to toggle the setting.
4. Press . The display reads Line loopback. If there is a test currently running on the Trunk Cartridge, the display shows the test name followed by running.
5. Press until the display shows the test you want to run. Options are line loopback, payload loopback or card edge loopback.
6. Press START to begin the test. The display shows the test name followed by running. If the trunk cartridge slot is empty or occupied by an analog trunk cartridge, the display reads Unequipped.
7. Press until the display reads 9.Loopback Tests. To initiate a loopback test on a second trunk cartridge, repeat steps 2 to 6 above.

Stopping a line, payload or card edge loopback test

Start with the display reading 9.Loopback Tests:

1. Press . The display reads Test:TC1 on KSU.
2. Press CHANGE until the display shows the TC you are testing.
3. Press . The display shows the test name followed by running.

4. Press STOP. The display reads `Test stopped` and returns to 9. `Loopback Tests`.

If either the ICS or the DTI is reset while a test is underway, the test will automatically stop. In this instance, no stop test event will appear in the system test log.

Starting or stopping a continuity loopback test

You start the continuity loopback test by pressing the button on the front of the DTI. Calls on all lines on the cartridge are automatically dropped when a loopback test is invoked.



Give notice that you are running a loopback test

Use the Page feature to notify people using the system that a test is about to begin and that calls will be disconnected.

The red LED light above the button remains on until the test is canceled.

Invoking a Continuity loopback test automatically cancels any other test in progress.

To stop the continuity loopback test, press the button on the DTI. The red LED light above the button turns off when the test is canceled.

CSU Stats

Each DTI is equipped with an internal channel service unit (CSU). When enabled, the internal CSU monitors the quality of the received T1 signal and provides performance statistics and diagnostic information.

DTIs must be individually programmed to establish parameters for collecting and measuring transmission performance statistics by the CSU. For information on programming your DTIs, see Trk/Line Data in the Programming chapter.

Statistics

The CSU provides both performance and alarm statistics.

Three performance parameters are accumulated:

- errored seconds (ES-P)
- severely errored seconds (SES-P)
- unavailable seconds (UAS-P)

These parameters are defined as per TIA-547A. Errored seconds are enhanced to include control slip (CS) events.

The parameters are stored for the previous 15 minute interval, the 15 minute intervals in the last 24 hours, and the previous 24 hour interval. Only near-end performance data is recorded.

The internal CSU continuously monitors the received signal and detects four types of transmission defects:

- any active carrier failure alarms (CFA) (loss of signal LOS, out of frame OOF, alarm indication signal AIS, remote alarm indication RAI)
- the number of bipolar violations that occurred in the last minute
- any defects (loss of signal LOS, out of frame OOF, alarm indication signal AIS) that occurred in the last minute

- the number of milliseconds of short term alarms (loss of signal LOS, out of frame OOF, alarm indication signal AIS, remote alarm indication RAI) in the last minute. A short term alarm is declared when the detected defects persist for tens of milliseconds.

A carrier failure alarm (CFA) is a duration of carrier system outage. CFA types reported can be mapped to CFAs defined in TIA-547A and TR62411 as follows:

Norstar	TIA-547A	TR62411
LOS CFA	Red CFA	Red CFA
OOF CFA	Red CFA	Red CFA
AIS CFA	Red CFA	AIS CFA
RAI CFA	Yellow CFA	Yellow CFA

The criteria for declaring and clearing the alarms is selectable to meet those in TIA-547A or TR62411.

Checking the performance statistics

To check the performance statistics, start with the display reading **10.CSU Stats:**

- Press . The display reads **Show TC:**. (If the ICS is not equipped with DTIs, or if both cartridges have their internal CSU setting programmed to off, the display reads **Unequipped**.)
- Press or depending on which Trunk Cartridge you are checking. The display reads **Error free:** followed by the percentage of error free seconds in the current 15 minute interval.
- Press . The display shows the date and time that the system began collecting statistics.
- Press . The display reads **Performance stats**.
- Press to view the performance stats. The display reads **Current interval**.

6. Press to display the duration of the current interval.
OR
Press until the display shows the type of interval statistics you want to check. Options are:
 - **15 min intervals** for intervals in the last 24 hours, numbered from the most recent (01) to the oldest (96). Press , then enter an interval number, or press to view the most recent interval. The display shows the start time of the interval.
 - **24 hour summary** for an overall summary of the previous 24 hours. Press to display the number of intervals in the summary.
7. Press . The display reads **ES:** followed by the number of errored seconds.
8. Press . The display reads **SES:** followed by the number of severely errored seconds.
9. Press . The display reads **UAS:** followed by the number of unavailable time seconds.
10. Press until the display reads **Performance stats.**

Checking the CSU alarms

To check the CSU alarms, start with the display reading **Performance stats.**

1. Press . The display reads **Alarm stats.**
2. Press . The display shows either **No active alarms** if there are no alarms, or **Active alarms** if alarms are present.

Checking active alarms

Start with the display reading **Active alarms.**

1. Press . The display shows the first active alarm.
2. Press or to cycle through the complete list of active alarms.
3. Press to return to **Active alarms.**

Checking carrier failure alarms

Start with the display reading No active alarms or Active alarms.

1. Press . The display reads CFA alarms.
2. Press . The display reads LOS CFA history, OOF CFA history, RAI CFA history or AIS CFA history.
3. Press until the display shows the type of alarms you wish to view.
4. Press . The display shows the first history item and the time that the alarm started.
5. Press and to move through the history items.

Checking bipolar violations

Start with the display reading No active alarms or Active alarms.

1. Press until the display reads Bipolar violation.
2. Press . The display shows the number of bipolar violations that occurred in the last minute.

Checking short term alarms

Start with the display reading No active alarms or Active alarms.

1. Press until the display reads ShortTerm alarms.
2. Press . The display shows the first type of short term alarm and the number of milliseconds (not necessarily contiguous) it was active in the last minute.
3. Press and to move through the short term alarms.

Checking Defects

Start with the display reading **No active alarms** or **Active alarms**.

1. Press until the display reads **Defects**.
2. Press . The display shows the first type of defect and the number of milliseconds (not necessarily contiguous) the hardware reported it active in the last minute.
3. Press and to move through the defects.

Resetting all statistics

Start with the display reading **Alarm stats**:

1. Press . The display reads **Reset all stats?**.
2. Press **YES** to erase all the current statistics and begin collecting statistics again.

Maintenance records

Maintenance records are tables used to record information you have obtained while running a Maintenance session.

Before you begin, photocopy the tables in this section.

Recording information on the Maintenance records

To use the following records, do the following:

1. While running a Maintenance session, enter the information on a photocopy of the appropriate Maintenance record.
2. Return the completed records to your Norstar distributor.

Test

1. *Journal of the American Medical Association*, 1997; 277: 1033-1036.

Specifications

Norstar system Service tone cadences

Tone	Cadence (seconds)
Busy	0.5 on / 0.5 off
Expensive Route	0.3 on / 0.3 off (3 bursts)
Overflow	0.25 on / 0.25 off
Ringback	2.0 on / 4.0 off
Confirmation	1.0 on / 1.0 off (3 bursts followed by no tone)
Recall	1.0 on / 1.0 off (3 bursts followed by steady tone)
Ring splash	0.2 on (1 burst)

Power specifications

Characteristic	ICS	TM	SM
Voltage V ac	110-120	110-120	110-120
Current A rms (max)	2.6	1.75	1.0
Frequency Hz	47-63	45-70	45-70
Crest factor	4.0	4.0	4.0

Telephone loop specifications

Characteristic	Value
Loop resistance	64 Ω (300 m of 0.5 mm wire or 1000 ft. of 24 AWG wire)
Loop length	300 m (1000 ft.) without station auxiliary power supply 790 m (2500 ft.) with station auxiliary power supply
Minimum voltage at telephone	10 V dc
Current at telephone (idle)	45 mA nominal
Current at telephone (active)	80 mA maximum

Electrical requirements

Characteristic	Spec/Value
Electrostatic discharge	
ICS and telephones	IEC 801-2 severity level 3 maximum of 15 kV with a 300 Ω /150 pF probe
Connectors	IEC 801-2 severity level 2
Radiated immunity	maximum of 5 V/m from 100 kHz to 1 GHz
Conducted immunity	maximum of 3 V rms from 0.1 MHz to 30 MHz

Environmental requirements

Characteristic	Spec/Value
Operating temperature range	0°C to 50°C (32°F to 122°F) IEC. 68-2-1 Tests Ad and IEC 68-2-2, Method A
Storage temperature range	-50°C to 70°C (-31°F to 158°F) IEC. 68-2-2 Test Bd
Humidity above 34°C (93°F)	5% to 95% (non-condensing) <52 mbar of water vapor pressure

Digital Trunk Interface

Network interface

Characteristic	Spec/Value
Physical	RJ48C 8-pin modular jack
Line rate	1.544 +/- 32 Mbps
Framing	Superframe/extended superframe*
Line code	AMI/B8ZS*
Impedance	100 Ω

* These values are set in Configuration programming. See the Programming chapter for details.

DSX1 operation

Characteristic	Value
Pre-equalization	0-210 m (0-700 ft.)*

* This value is set in Configuration programming. See the Programming chapter for details.

CSU operation

Characteristic	Spec/Value
Line build out	0, 7.5 or 15 dB*
Input dynamic range	0 to -26 dB (typical)
Performance reporting	Simultaneous support of TR 54016 or TIA-547A
Line loopback support	Remote activation/deactivation via in-band code or FDL as per TR 54016 or TIA-547A
Payload loopback support	Remote activation/deactivation via FDL as per TR 54016 or TIA-547A
Carrier failure alarms (CFA)	Alarm indication signal (AIS), Red Yellow

* This value is set in Configuration programming. See the Programming chapter for details.

Synchronization performance

Characteristic	Spec/Value
Stratum	4E

Digital trunk signaling support

Types	Options
Loop Start with answer and disconnect supervision	OSI interval* Pulse/DTMF dialing*
E&M	Immediate start (Pulse dialing only), Wink start, Delay start or ring-down tie line* Pulse/DTMF dialing*
DID	Immediate start (Pulse dialing only), Wink start or Delay start* Pulse/DTMF dialing* Ground start

* These values are set in Configuration programming. See the Programming chapter for details.

Local test support

Characteristic	Value
Monitor jack	Bridging via Bantam jack
Line loopback	activate/deactivate via maintenance*
Payload loopback	activate/deactivate via maintenance*
Card edge loopback	activate/deactivate via maintenance*
Continuity loopback	activate/deactivate via push button on faceplate*

* See Loopback Tests in the Maintenance chapter for details on running these tests.

Upgrading your system

Upgrading your hardware



Perform software upgrades first

When making simultaneous 0X32 Release 1 - T1 hardware and software upgrades, upgrade your software release before making your hardware upgrades. Make sure to power up after the new software has been installed. Upgrading in this order maintains your 0X32 programming data for use with DR 1.1 and XC 1.1.

If you are upgrading the system to include Companion components, see the upgrade instructions included in the *Norstar-Companion MICS-XC 1.1 Installer Guide*.

ICS

If you have a Norstar system with a Modular 0X32 Integrated Communication System (ICS), you can use your ICS with the new DR 1.1 and XC 1.1 software.

Note: Previous users of the Norstar 0X32 system should note that the Key Service Unit (KSU) has been renamed the Integrated Communication System (ICS).

Upgrading from 0X32 Release 1-T1 to DR 1.1 and XC 1.1

0X32 Release 1 mini

to DR 1.1/XC 1.1 mini

Install DR 1.1 or XC 1.1 feature cartridge.

Use module 1 (ports 101 to 132) for sets only and module 2 for Trunk Cartridges only.

to DR 1.1/XC 1.1 midi

Install DR 1.1 or XC 1.1 feature cartridge.

Install 2-port Expansion Cartridge.

Connect trunk modules beginning at port 4 and station modules beginning at port 3.

to DR 1.1/XC 1.1 maxi

Install DR 1.1 or XC 1.1 feature cartridge.

Install 6-port Combo Cartridge.

Connect trunk modules beginning port 8 and work down and station modules beginning at port 3 and work up.

to XC 1.1 mega only

Install XC 1.1 feature cartridge.

Install two 6-port Combo Cartridges or one 6-port expansion module and one Combo Cartridge in ICS slots 1 and 2

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up, skipping any trunk modules, to port 12.

Trunk modules cannot be connected to the Combo Cartridge in slot 1. (DS-30 ports 9 through 14)

**0X32
Release
1 midi****to DR 1.1/XC 1.1 midi**

Install DR 1.1 or XC 1.1 feature cartridge.

to DR 1.1/XC 1.1 maxi

Install XC 1.1 or DR 1.1 feature cartridge.

Replace 2-port Expansion Cartridge with 6-port Combo Cartridge in ICS slot 2.

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up.

to XC 1.1 mega only

Install XC 1.1 feature cartridge.

Replace 2-port Expansion Cartridge with two 6-port Combo Cartridges or one 6-port expansion module and one Combo Cartridge in ICS slots 1 and 2, skipping any trunk modules, to port 12.

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up.

Trunk modules cannot be connected to the Combo Cartridge in slot 1. (DS-30 ports 9 through 14)

**0X32
Release
1 maxi****to DR 1.1/XC 1.1 maxi**

Install DR 1.1 or XC 1.1 feature cartridge.

to XC 1.1 mega only

Install XC 1.1 feature cartridge.

Install one 6-port Combo Cartridge in ICS slot 1.

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up.

Trunk modules cannot be connected to the Combo Cartridge in slot 1. (DS-30 ports 9 through 14)

Upgrading from XC 1.0 to XC 1.1

To upgrade from an XC 1.0 to an XC 1.1 system, replace the feature card.

Upgrading from DR 1.1 to XC 1.1

DR 1.1 mini

to XC 1.1 mini

Install XC 1.1 feature cartridge.

Use module 1 (ports 101 to 132) for sets only and module 2 for Trunk Cartridges only.

to XC 1.1 midi

Install XC 1.1 feature cartridge.

Install 2-port Expansion Cartridge in slot 2.

Connect trunk modules beginning at port 4 and station modules beginning at port 3.

to XC 1.1 maxi

Install XC 1.1 feature cartridge.

Install 6-port Combo Cartridge in slot 2.

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up.

DR 1.1 midi

to XC 1.1 midi

Install XC 1.1 feature cartridge.

to XC 1.1 maxi

Install XC 1.1 feature cartridge.

Replace 2-port Expansion Cartridge with 6-port Combo Cartridge in ICS slot 2.

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up.

**DR 1.1
maxi****to XC 1.1 maxi**

Install XC 1.1 feature cartridge.

to XC 1.1 mega

Install XC 1.1 feature cartridge.

Replace 2-port Expansion Cartridge with two 6-port Combo Cartridges or one 6-port expansion module and one Combo Cartridge in ICS slots 1 and 2, skipping any trunk modules, to port 12.

Connect trunk modules beginning at port 8 and work down and station modules beginning at port 3 and work up.

Trunk modules cannot be connected to the Combo Cartridge in slot 1. (DS-30 ports 9 through 14)

Tips

Trunk modules cannot be connected to the Combo Cartridge in slot 1.

To add Trunk and /or Station Modules to ports 13 and 14 in a mega system refer to *Norstar-Companion MICS-XC 1.1 Installer Guide*.

Trunk and Station Modules

If you are not adding digital T1 trunks to your system or expanding to a mega configuration, you may reuse your existing copper Trunk and/or Station Modules with the Modular 0X32 ICS in DR 1.1/XC 1.1. One 6-port copper expansion cartridge can be supported on the maxi configuration.

If you are adding digital T1 trunks to your system or expanding to a mega configuration, you must replace any copper Trunk and/or Station Modules with the new modules that have fiber connectors, and use a new fiber Expansion Cartridge in the ICS. You can reuse your old Trunk Cartridges in the new Trunk Module with fiber connectors.

Trunk modules cannot be installed on the second expansion (6-port) cartridge. You must re-locate station modules to the second expansion cartridge to free up ports on the first 6-port expansion cartridge.

The following table shows which cartridges are compatible with which ICSs and Trunk Modules.

Module/Cartridges	8X24		0X32		DR 1.1/ XC 1.1	
	ICS	TM	ICS	TM	ICS	TM
Feature Cartridge - 2 piece	√					
Feature Cartridge - 1 piece			√		√	
Expansion Cartridge 2-port copper - NT5B26GA-93	√					
Expansion Cartridge 6-port copper - NT5B27GA-93	√					
Expansion Cartridge slim 2-port fiber - NTBB02GA-93			√		√	
Expansion Cartridge slim 6-port fiber - NTBB06GA-93			√		√	
Expansion Cartridge 2-port copper - NTBB03GA-93			√		√	
Expansion Cartridge 6-port copper - NTBB07GA-93			√		√	
Loop Start TC - NT5B40GA-93		√		√		√
Loop Start TC - NT7B75GA-93		√	√	√	√	√
CI TC - NT5B41GA-93		√	√	√	√	√
E&M TC - NT5B38GA-93		√		√		√
DID TC - NT5B37GA-93		√		√		√
DTI - NT7B74GA-93			√		√	
Services Cartridge - NTBB24GA-93			√		√	
Combo Cartridge (Services Cartridge and 6-port fiber expansion)					√	

If you are upgrading your ICS and adding digital T1 trunks to your system:

1. Verify your system programming, and update your *Programming Record*.
2. Follow the procedures outlined in the Installation chapter for installing a new system.

If you are upgrading your ICS, but not adding digital T1 trunks:

1. Verify your system programming, and update your *Programming Record*.
2. Remove power from your system.



When upgrading, Call Log information may be lost

Over system restarts Call Log information is not saved. Make sure to notify users if a system restart is planned so any log information can be written down first.

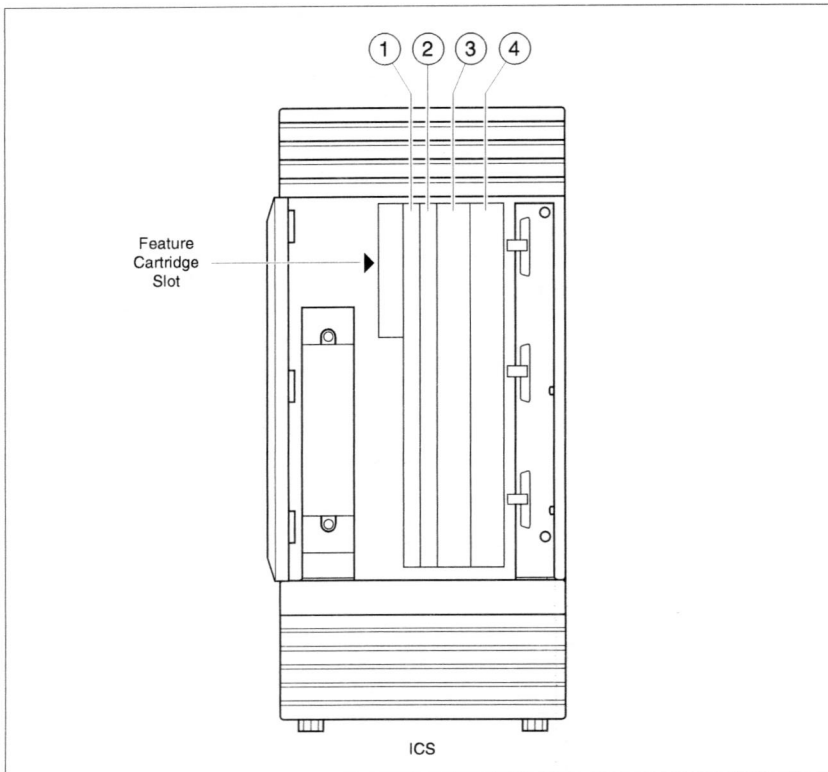
3. Disconnect the 50-pin connector for telephones from the ICS.
4. Disconnect the 50-pin connector for external lines and auxiliary equipment from the ICS.
5. If your system includes Trunk Modules and Station Modules with DS-30 copper connectors, disconnect the DS-30 copper connectors from the Expansion Cartridge.
6. Remove any cables from the ICS cable trough.
7. Remove the ICS and wall-mount bracket from the wall.
8. Install the new ICS following the procedures in the Installing the hardware chapter.

9. If your system includes Trunk Modules and or Station Modules with DS-30 copper connectors, install a compatible Expansion Cartridge with copper connectors in slot 1 of the ICS. The faceplate will cover slots 1 and 2.

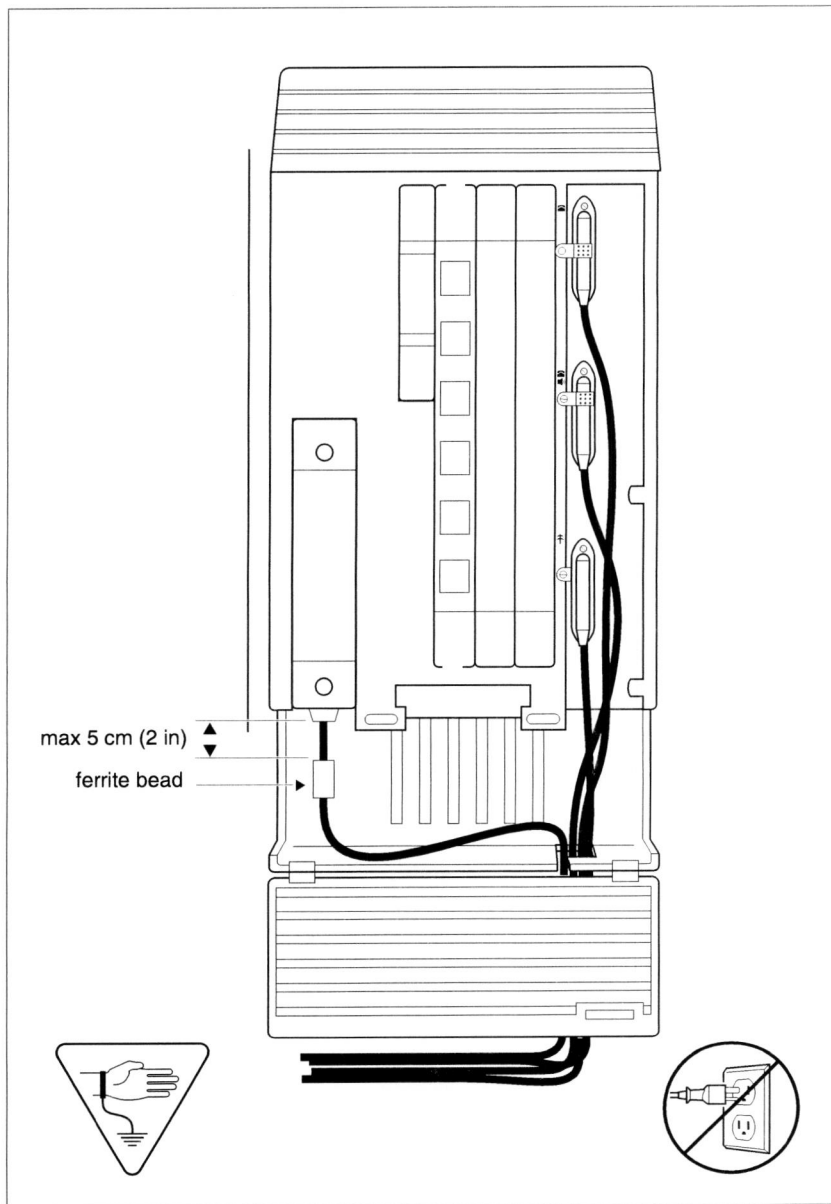


Do not reuse existing Expansion Cartridge

You cannot reuse an 8X24 Expansion Cartridge in the 0X32 ICS. You must install a new XC 1.1 Expansion Cartridge or reuse your 0X32 Expansion Cartridge with copper connectors.



10. If you have installed a copper Expansion Cartridge in the 0X32 ICS, clip the ferrite bead that was shipped with the Expansion Cartridge onto the ICS power supply power cord.



**Ferrite bead required to meet EMI requirements**

When using a copper Expansion Cartridge, you must install the ferrite bead on the ICS power cord to ensure that the product continues to meet FCC Part 15 Class A EMI requirements.

11. If your system includes Trunk Modules and or Station Modules with DS-30 copper connectors, reconnect the DS-30 cables to the Expansion Cartridge.
12. Reconnect your 50-pin connector for internal telephones to the internal telephone connector on the ICS.
13. Reconnect your external line and auxiliary equipment wiring according to the procedures and wiring charts in the Installing the hardware chapter. You cannot reuse your original 50-pin connector for external lines and auxiliary equipment because the pin-outs have changed.

**DNs on Station Modules will change**

If you simply reconnect the 50-pin connector for telephones on the ICS, and leave your Station Modules telephone connectors as is, your directory numbers will change. The new 0X32 ICS can accommodate 32 telephones; the old 8X24 ICS connected only 24. Port numbering has been changed accordingly.

To preserve existing directory numbers consult the wiring charts in Installing the hardware and change the DNs using *Individual DNs in System Data in Configuration programming*.

14. Power up the system.

Upgrading your software

If you have a Norstar system with a Modular 8X24 Key Service Unit (KSU), you cannot upgrade your software with the DR 1.1 or XC 1.1 software release. If you wish to use the newest DR 1.1/XC 1.1 software release, you must replace your older KSU with the current 0X32 ICS and program the system.



Perform software upgrades first

When making simultaneous DR 1.1/XC 1.1 hardware and software upgrades, upgrade your software release before making your hardware upgrades. Make sure to power up after the new software has been installed. Upgrading in this order maintains your 0X32 programming data for use with the upgraded system.

All your old programming is maintained when upgrading from the 0X32 Release 1 - T1 software. However, it is always important and recommended to have an accurate record of your existing system programming so that you can plan your new system programming appropriately.

Before you upgrade, review your system programming and update your new *Programming Record*. Use this information to plan your new system programming appropriately.

Tips

If you use Norstar Manager to program your system, there is a way you can upgrade your 8X24 or 0X32 Release 1 - T1 software to the DR 1.1/XC 1.1 software release. Consult your Norstar Manager documentation for details.

To upgrade to DR 1.1/XC 1.1 from 0X32 Release 1 - T1, all you need to do is replace the feature cartridge. All 0X32 Release1-T1 data is maintained and converted for use with the new DR 1.1/XC 1.1 feature enhancements. Refer to Installing the cartridges on page 60 for more information.



When upgrading, Call Log information may be lost

Over system restarts Call Log information is not saved. Make sure to notify users if a system restart is planned so any log information can be written down first.

Glossary

A

Access code: A sequence of characters used to gain entry into any type of Norstar system programming.

Administration: A programming section that lets you assign and maintain certain settings on the Norstar system. Administration programming is performed by the system coordinator.

Administration access code: To access Administration programming, press

Feature * * A D M I N .

You will be asked for an Administration password.

Administration password: A one-to six-digit password that prevents unauthorized access to Administration programming. The Administration password can be assigned and changed in Administration programming.

Alarm code: A number that appears on the alarm telephone's display, informing you that the ICS has detected a fault in the system.

Alarm telephone: A telephone that is designated to receive reports of Norstar system problems. This function is usually assigned to a prime telephone, but this can be changed in Configuration programming.

Analog Terminal Adapter (ATA): A device that permits the connection of analog telecommunication devices such as fax machines, answering machines, and single line telephones to the Norstar system. Programmed defaults for the ATA are automatically assigned by the Norstar system.

Answer button: A telephone button with an indicator that is used to monitor another telephone. The answer button indicates incoming calls destined for the other telephone. Someone working at a telephone with answer buttons (an attendant, for example) can receive all ringing and visual indication of incoming calls for other telephones, and answer those calls when necessary.

One telephone can have up to four Answer buttons. An Answer button is automatically assigned to a telephone when that telephone is assigned an Answer DN.

Answer DN: The directory number (DN) of a telephone that is monitored by an Answer button. You can assign up to four Answer DNs to a telephone in Configuration programming.

Autobumping:

Feature 8 1 5

A feature that determines what the system does with new Call Log items when your Call Log is full. When Autobumping is on, a new log entry causes the oldest entry to be deleted. If Autobumping is off, your Norstar system does not log calls when your log is full.

Autodial button: A memory button that, if programmed, provides one-touch dialing of external or internal numbers.

Autolog options:

Feature ☐ * ☐ 8 ☐ 4

A feature that allows you to select the type of calls that are stored in your Call Log. You can choose to log calls that were not answered by anyone within the system, to log calls that were unanswered at this telephone but answered elsewhere in the system, to log all calls answered and not answered at this telephone, or to not have calls automatically logged.

Automatic Dial: A feature that allows you to dial without having to pick up the receiver or select a line. You must have a prime line to use Automatic Dial.

Automatic Handsfree: A feature which automatically activates Handsfree operation when you make or answer a call. Automatic Handsfree is assigned in Administration programming.

Automatic Hold: A feature that automatically places an active call on hold when you select another line. Automatic Hold is programmed in Configuration programming.

Automatic Privacy: See Privacy.

Automatic Daylight Savings

Time: A feature that switches the system to standard or daylight savings time at pre-programmed times. It is turned on or off in Configuration programming.

Automatic Telephone Relocation:

A feature that lets a telephone retain its personal and system programming when it is plugged into a different Norstar modular jack. Automatic Telephone Relocation is enabled in Configuration programming.

Auxiliary ringer: A separate external telephone ringer or bell which can be programmed to ring when a line or a telephone rings. An auxiliary ringer may be programmed to ring only when the system is in a particular service mode. Programming of an auxiliary ringer is done in Administration programming after the feature has been enabled in Configuration programming.

B

Base Station (XC 1.1 only): A Companion component that is mounted on walls and ceilings to provide a radio link to an office or other area where Companion portable telephones are used. Each Base Station houses two radios that allow portables to send and receive calls through the ICS. (See also Companion Wireless)

Background Music: A feature that lets you hear music from the speaker of your Norstar telephone. It is available only if a music source has been attached to the ICS and the feature has been enabled in Configuration programming.

Busy Lamp Field (BLF): A device with a liquid crystal display (LCD) panel of indicators that shows the status of up to 24 telephones in the Norstar system. The BLF attaches to the M7310 telephone.

Button caps: Interchangeable plastic caps that fit over the buttons of Norstar telephones. They are used to indicate the features programmed onto each programmable memory button. Button caps are either pre-printed or have clear windows that allow you to insert labels.

Button Inquiry:

Feature * 0

With this feature you can check the function of each programmable button on your Norstar telephone.

C

Call Duration timer:

Feature 7 7

A feature that lets you see how long you spent on your last call or how long you have been on your present call.

Call Forward:

Feature 4

A feature that forwards all the calls arriving at your telephone to another telephone in your Norstar system. To have calls forwarded outside the system, use Line Redirection.

Call Forward No Answer: A feature that forwards all calls arriving at your telephone to another designated telephone in your Norstar system after a specific number of rings. Call Forward No Answer is assigned in Administration programming.

Call Forward On Busy: A feature that forwards all calls at your telephone to another designated telephone if your telephone is busy. This feature is assigned in Administration programming.

Call Forward Override: Call Forward Override lets you call someone and ask them to stop forwarding their calls to you.

Call Information:

Feature 8 1 1

Call Information allows you to display information about incoming calls. For external calls, you can display the caller's name, telephone number and the line name. For an internal call, you can display the name of the caller and their internal number. You can obtain information about ringing, answered, or held calls.

Call Information Trunk Cartridge:

The Trunk Cartridge that allows you to connect loop start trunks with Call Information capability to the Norstar system.

Call Log:

Feature 8 1 2

Enter your Call Log to view a record of incoming calls. The log could contain the following information for each call: sequence number in the Call Log, name and number of caller, long distance indication, indication if the call was answered, time and date of the call, number of repeated calls from the same source, and name of the line that the call came in on. See Autobumping, Autolog options, and Logit for further information.

Call Park:

Feature 7 4

With this feature you can place a call on hold so that someone can retrieve it from any other telephone in the Norstar system by selecting an internal line and entering a retrieval code.

The retrieval code appears on the display of your telephone when you park the call. You can park up to twenty-five calls on the system at one time.

Call Park Callback: See Callback.

Call Park prefix: The first digit of the retrieval code of a parked call. This digit cannot conflict with the first digit of any existing DNs, Line Pool access codes, the Direct-dial digit, or the external line access code. The default Call Park prefix digit is "1". It may be set to none, in which case Call Park is disabled. Call Park prefix is assigned in Configuration programming.

Call Pickup Directed:

Feature

A feature that lets you answer a call ringing at any Norstar telephone by entering the internal number of that telephone before taking the call. Call Pickup Directed is enabled in Configuration programming.

Call Pickup Group: See Pickup Group.

Call Queuing:

Feature

If you have several calls waiting at your telephone, you can invoke the Call Queuing feature to answer them in order of priority. Priority is given to incoming calls, followed by callback and camped calls.

Callback: If you park, camp, or transfer a call to another telephone and it is not answered there, it will ring again at your telephone. How long the system will wait before Callback occurs is set in Configuration programming.

Camp-on:

Feature

A feature that lets you reroute a call to a telephone even if all the lines on that telephone are busy. To answer a camped call, use Call Queuing or select a line if the camped call appears on your telephone. Priority is given to queued calls over camped calls.

Camp timeout: The length of a delay before a camped call is returned to the telephone that camped the call. The length of delay is set in Configuration programming.

Central answering position

(CAP): An M7324 telephone that has been designated a CAP in Configuration programming. The CAP provides backup answering and can be used to monitor the telephones within a Norstar system. One or two CAP modules can be attached to a CAP to increase the number of lines it can handle.

Central answering position (CAP)

module: A module connected to an M7324 telephone and provides 48 additional buttons that can be used as autodial buttons or feature buttons. A maximum of two CAP modules can be connected to a single M7324 telephone.

Channel Service Unit (CSU):

A device on the Digital Trunk Interface that is the termination point of the T1 lines from the T1 provider. The CSU collects statistics on the quality of the T1 signal. The CSU ensures network compliance with FCC rules and protects the network from harmful signals or voltages.

Class of Service (COS): The set of Norstar features and lines available to the user for a call. The Class of Service for a call is determined by the dialing filters and remote access packages assigned to the telephone in Administration programming. The Class of Service for a call can be changed by entering a six-digit Class of Service password. (Internal users cannot change their access to features with a COS password, only their dialing filters.) Class of Service and Class of Service passwords are assigned in Administration programming. See Remote Access.

Class of Service password:

Feature

A six digit code that lets you switch from your current Class of Service to one that lets you dial numbers prohibited by your current Class of Service.

Combo Cartridge: A cartridge that allows you to connect Trunk Modules and Station Modules to the ICS to expand the system's capacity for trunks and telephones. Combo Cartridges provide six-port or 12-port expansion and Services functionality with each cartridge. (See also Expansion Cartridge.)

Companion Wireless (XC 1.1 only): The name for Northern Telecom communication systems which use radio technology to transmit and receive signals between its components and the Norstar system. Companion Wireless provides mobility in the workplace. Calls that used to ring just at your Norstar set can also appear and ring at your portable.

Companion Portable Telephone:

Hand-held wireless sets which allow complete mobility within the reach of Companion Base Stations or an external antenna. Portables offer many but not all Norstar features and share much of the same programming as "wired" desk sets.

Conference:

Feature

The Conference feature allows you to establish a three-person call at your Norstar telephone.

Configuration: A programming section that lets you assign and maintain certain settings on the Norstar system. Configuration programming is performed by an installer or customer service representative.

Configuration access code: To access Configuration programming, press Feature . You will be prompted for a Configuration password.

Configuration password: A one-to six-digit password that prevents unauthorized access to Configuration programming. The Configuration password can be assigned and changed in Configuration programming.

Contrast Adjustment:

Feature

Allows you to set the contrast level of your telephone display.

Control telephone: A control telephone can place the lines for which it has responsibility in or out of a Service Mode.

The direct-dial telephone is a control telephone for directing calls to the extra direct-dial telephone. A telephone is made a control telephone and has lines assigned to it in Administration programming.

COS: See Class of Service.

Cursor: A short horizontal line that appears on the Norstar telephone display to indicate that characters can be entered using the dial pad.

D

Data Communications Interface (DCI): A Norstar device that lets you attach an RS-232 data device to the Norstar system.

Data terminal: A device such as a modem that can be used to transfer data instead of sound over a telephone network. You cannot use Norstar programming to set up such devices. See the documentation that accompanies the device.

Date: See Show Time or Time and Date.

Defaults: The settings for all Norstar features when the system is first installed. Settings are changed from their defaults in Administration programming and Configuration programming. In this manual, default settings are shown in **bold** text.

Delayed Ring Transfer (DRT) to prime: After a specified number of rings, this feature transfers an unanswered call on an external line, to the prime telephone associated with that line. This feature is activated in Configuration programming.

Destination code: A Configuration programming feature, destination codes are programmed by the installer using 3. Routing. When using Routing Service, if a dialed number starts with a destination code, the system uses a line pool and dials out digits specified by the route assigned to that destination code. The system then dials the rest of the number that was dialed. See also Routing Service.

DID trunk: See Direct Inward Dial trunks.

DID Trunk Cartridge: The Trunk Cartridge that allows you to connect DID trunks to the Norstar system.

Dialing filter: Through a combination of restrictions and exceptions, dialing filters prevent certain telephone numbers or feature codes from being dialed. Dialing filters can be applied to lines (line filters, remote filters), to sets (set filters), to specific lines on a set (line/set filters), and to Class of Service passwords (user filters, remote filters). The Norstar system can handle up to 100 dialing filters.

Dialing Modes:

Feature * 8 2

This feature allows you to set the dialing mode of your telephone. Norstar supports three dialing modes: Automatic Dial, Pre-Dial, and Standard Dial. All three modes support on-hook dialing (meaning you can dial a call without picking up the receiver). The special features of the Automatic and Pre-Dial modes are available only when you dial on-hook.

Digital Trunk Interface: The Trunk Cartridge connects digital T1 trunks to the Norstar system.

Direct-dial: A feature that lets you dial a designated telephone in your Norstar system with a single digit. As many as five direct dial sets can be established. Each telephone in the system is assigned to one direct-dial telephone. There is a single, system wide digit for calling the assigned direct-dial telephone of any telephone. Direct-dial telephones are established in Administration programming. Telephones are assigned to a direct-dial telephone in Administration programming.

Direct-dial #: A digit used system-wide to call a direct dial telephone. The digit is assigned in Configuration programming.

Direct-dial number: The digit used to call the direct-dial telephone.

Direct Inward Dial trunk: Trunks that allow direct inward dialing from the public network to the Norstar system.

Direct inward system access (DISA): The feature that lets remote users dial directly into the Norstar system and use Norstar features. Callers will hear stuttered dial tone and will be required to enter a Class of Service password to gain access to the system. See Remote Access.

Directed Pickup: See Call Pickup Directed.

Directory number (DN): A unique number that is automatically assigned to each telephone or data terminal. The DN, also referred to as an internal number, is often used to identify a telephone when settings are assigned during programming.

Default DN assignments start at 21 in a two-digit (non-expanded) system and 221 in a three-digit (expanded) system.

DISA DN: The received number assigned to the Norstar direct inward system access facility. If a caller dials a number that is assigned to the DISA DN, the caller hears stuttered dial tone and must enter a Class of Service password. Once the password is accepted, the caller hears system dial tone and can use Remote Access features. See Remote Access.

Disconnect Supervision: A setting that enables the Norstar system to detect if an external caller hangs up. Once an external caller hangs up, the Norstar system can disconnect its line. Disconnect Supervision is enabled in Configuration programming.

Display: A liquid crystal display (LCD) on the Norstar telephone that guides you through feature operation and programming.

Display button: The Norstar M7310 telephone and M7324 telephone are each equipped with three buttons located directly beneath the display. During feature operation or programming, some or all of these buttons may be used to provide further options. If an option is available, it is shown in the bottom row of the two row display, directly above the corresponding display button. Display buttons are represented in this manual as underlined capital, e.g. OK.

DN: See Directory number.

Do Not Disturb:Feature

A feature that stops calls from ringing at your telephone. Only Priority Calls will ring at your telephone. A line button will flash when you receive a call, but the call will not ring.

DTI: See Digital Trunk Interface.

E

E&M/DISA Trunk Cartridge: The Trunk Cartridge that allows you to connect E&M trunks to the Norstar system. The E&M Trunk Cartridge also allows DISA access to the system by providing DTMF receivers for auto-answer trunks.

Emergency telephone: A single-line telephone (also referred to as a 500/2500 telephone) that becomes active when there is no power to the Integrated Communication System.

Event message: Event messages are stored in the system log and displayed during a Maintenance session. They record a variety of events and activities in the Norstar system.

Exceptions: One component of a dialing filter. Exceptions are numbers you can dial even if they are forbidden by a more general Restriction. See Restrictions.

Expansion Cartridge: A cartridge that allows you to connect Trunk Modules and Station Modules to the ICS to expand the system's capacity for trunks and telephones.

There are two Expansion Cartridge: a two-port Expansion Cartridge and a six-port Expansion Cartridge. (See also Combo Cartridge.)

External call: A call to a destination outside the Norstar system.

External Call Forward: See Line Redirection.

External code: The number you dial to get an external line. By default it is 9, but this can be changed in Configuration programming. You do not always need an external code. It is primarily to support the M7100 telephone and single line telephones using an Analog Terminal Adapter.

External line: A line on your Norstar telephone used for making calls to destinations outside the Norstar system.

External music source: See Music source.

External paging: A feature you can use to make voice announcements over an externally-mounted loudspeaker connected to the Integrated Communication System. The external speaker is not a Norstar component and must be supplied by the customer.

F

Feature button: Many Norstar features are invoked by pressing the Feature button followed by a feature code. The feature button is also used to exit a feature.

Feature Cartridge: A replaceable cartridge containing the Norstar features. The Feature Cartridge is inserted into the Integrated Communication System.

Feature code: A number that is used to activate a particular feature.

Feature programming:

Feature * 3

Allows you to program a feature code onto a memory button.

Forward: See Call Forward.

Full Autohold (on idle line): When this feature is on, if you select an available line, and then do something that selects another line, the first line is put on hold. Full Autohold is enabled in Configuration programming.

Full Handsfree: See Handsfree.

G

Ground Start trunk: Ground start trunks offer the same features as loop start trunks, but are used when the local service provider does not support disconnect supervision for the digital loop start trunks. By configuring lines as ground start, the system will be able to recognize when a call is released at the far end. Ground start trunks are provided only by a DTI.

Group Listening:

Feature 8 0 2

A feature that allows you to have others in your office hear a caller through your phone's speaker. The caller hears you only when you speak into the receiver and cannot hear other people in the office.

You can cancel Group Listen for the current call. Group Listen is cancelled automatically when you hang up the Group Listen call.

H

Handsfree:

Handsfree
Mute

A feature you can use to make calls without using the telephone receiver. Full Handsfree is activated in Administration programming. When it is activated, a Handsfree/Mute button is automatically assigned to the telephone.

Handsfree (HF) Answerback:

When activated, this feature automatically turns on the microphone at a telephone receiving a Voice Call so that the person receiving the call can respond without lifting the receiver. It is activated in Administration programming.

Handsfree/Mute button: See Handsfree.

Headset: A head-mounted or ear-mounted telephone receiver that is used instead of the hand-held receiver. Headsets are not Norstar components and must be supplied by the customer.

Held (Line) Reminder: A Norstar telephone rings and displays the message On hold: LINENAM when an external call has been placed on hold for a certain period of time. The Held Line Reminder feature and Remind delay are set in Configuration programming.

HF Answerback: See Handsfree Answerback.

Hold button:

Hold

This button is used to suspend calls so that the person using the telephone can perform another task without disconnecting the caller.

Hook Switch Flash: See Link time.

Host system signaling: (Also referred to as end-to-end signaling.) Norstar telephones can access a remote system or dial a number on an alternate carrier by means of host feature activation, such as Link, Pause and Run/Stop.

Hotline: This feature automatically calls a pre-assigned number when the telephone's receiver is lifted or the Handsfree/Mute button is pressed. A Hotline number can be an internal or external number. Hotline is assigned in Administration programming.

I

I/C: An abbreviation of intercom.

Incoming line group: A group of lines used for incoming calls. Incoming line groups provide a way of giving a telephone access to several incoming lines without taking up many line buttons. A line is assigned to be part of an incoming line group in Configuration programming.

Integrated Communication

System (ICS): The central hardware component in the Norstar system. The ICS has its own processor and memory, and provides a physical point of connection for the various types of devices, telephones, and expansion modules used in Norstar.

The ICS can function on its own as a basic system (with 32 Norstar telephones and up to 48 external lines), or with the addition of Trunk Modules (TM) that supports more external lines, or Station Modules (SM) that support more Norstar telephones.

Intercom button: A button that provides access to internal lines used for calls within a Norstar system and access to external lines through a line pool or external code. A telephone may be assigned zero to eight Intercom buttons. This is done in Configuration programming.

Intercom keys: See Intercom button.

Internal line: A line on your telephone dedicated to making calls to destinations inside your Norstar system. An internal line may still connect you with an external caller if you use it to access a line pool or to pick up a call using Norstar call handling features such as Call Park or Call Pickup Directed.

Internal number: A number (also referred to as a Directory Number or DN) that identifies a Norstar telephone or device.

Internal user: Someone using a Norstar telephone within a Norstar system.

K

Key Service Unit (KSU): Please see Integrated Communication System (ICS).

L

Last Number Redial:

Feature

A feature that allows you to redial the last external number you dialed.

Least cost routing: See Routing service.

Line: The complete path of a voice or data connection between one telephone (or other device) and another.

Line filter: See Dialing filter.

Line number: A number that identifies an external line. The total number of lines depends on how many Trunk Modules are installed.

Line Pool:

Feature

A group of lines used for making external calls. Line pools provide an efficient way of giving a telephone access to external lines without taking up many line buttons. A line is assigned to be part of a line pool in Configuration programming.

Line Profile: A feature you can use to review the settings that have been programmed to lines in Configuration and Administration programming. The settings cannot be changed with this feature. Line profile is available only on the M7310 and M7324 telephones.

Line Redirection:

Feature

A feature that allows you to redirect all calls on an incoming line to a destination outside the Norstar system. Once a line is redirected it cannot be answered within the Norstar system.

The system may be set up to give a brief ring when a call comes in on a redirected line. This feature differs from Call Forward in two ways. It redirects only external calls (not internal calls) and it redirects calls to destinations outside the system. Call forward redirects calls only to destinations inside the Norstar system. See Call Forward.

Link:

Feature

If your Norstar system is connected to a Private Branch Exchange (PBX), you can use a Link signal to access special features. The Link signal can also be included as part of a longer stored sequence on an External Autodial button or in a Speed Dial code. The Link symbol () uses two of the 24 spaces in a dialing sequence.

Logit:

Feature

Logit lets you manually log call information when you are connected to a call.

Long Tones:

Feature

A feature that lets you control the length of a tone so that you can signal devices such as fax or answering machines which require tones longer than the standard 120 milliseconds.

Loop Start Trunk Cartridge: The Trunk Cartridge that allows you to connect loop start trunks to the Norstar system.

M

M7100 telephone: A telephone with a single line display and one programmable memory button without an indicator.

M7208 telephone: A telephone with a single-line display and eight programmable memory buttons with indicators.

M7310 telephone: A telephone that has a two-line display, three display buttons, 10 programmable memory buttons with indicators, and 12 dual memory programmable buttons without indicators. An M7310 can be equipped with a Busy Lamp Field.

M7324 telephone: A telephone with a two-line display, three display buttons, and 24 programmable memory buttons with indicators. An M7324 telephone can be equipped with a CAP module.

Maintenance: A type of programming that is used to diagnose and repair problems in the Norstar system. Maintenance requires no programmable settings.

Memory buttons: Buttons that can be programmed to dial frequently used features or numbers automatically. See M7100, M7208, M7310, and M7324 telephone entries for their exact memory button configurations.

Message: A feature that allows you to send a message to another Norstar user. The Message feature also lets you know if you have any messages waiting and maintains a Message Waiting List to keep a record of your internal messages and your (external) voice mail messages.

Module: A component of the Norstar 0X32 key system. Includes the Integrated Communication System, Trunk Module and Station Module.

Move Line buttons:

Feature * 8 1

A feature that allows you to move external lines to different buttons on your telephone.

Music source: A radio or other source of music can be connected to the Integrated Communication System to provide music for the Music on Hold and Background Music features. A music source is not part of the Norstar system and must be supplied by the customer.

N

Names: Names can be assigned to System Speed Dial numbers, external lines, telephones, and Service Modes. This is done in Administration programming. You can use up to sixteen characters to name a System Speed Dial number, and seven characters to name a telephone, line, or Service Mode. If a Name has not been assigned, the line number or DN will appear on the display instead of a name.

O

On hold: A setting, programmed in Configuration programming, that controls whether external callers hear music, periodic tones, or silence when they are placed on hold.

Overlay: See Programming overlay.

Overflow: A setting in Routing Service that allows users to decide what path an outgoing call will take if all the lines used in a particular route are in use when the call is made.

P

Page:

Feature

A feature you can use to make announcements over the Norstar system. You can make page announcements over the telephone speakers and/or external speakers.

Page zone: An area in the office that receives internal page announcements independently of the rest of the office. Each page zone is identified by a number. Telephones are assigned to page zones in Administration programming.

Page Time out: A specified amount of time before a Page Announcement session ends.

Park mode: Park mode is a programming feature that allows you to select the order by which call park retrieval codes are assigned. By default, the system is configured to assign the lowest code available.

The second option assigns codes in a cyclical fashion from the lowest to the highest. See also Call park and Call park prefix.

Park prefix: See Call park prefix.

Park timeout: The time before an unanswered parked call is routed back to the telephone that parked it. Park timeout is in Configuration programming. See Call Park.

Password: A password is a specific sequence of digits that you enter to gain access to Norstar programming, to override dialing restrictions, or to use remote access with DISA. Passwords are also required for Startup, Configuration and Administration programming.

Pause:

Feature

A feature that enters a 1.5 second delay in a dialing sequence on an external line. This is often required for signaling remote devices, such as answering machines, or when reaching through to PBX features or host systems. The Pause symbol (⏸) uses one of the 24 spaces in a dialing sequence. For pulse dialing, * inserts a 1.5 second pause into the dialing sequence.

Personal Speed Dial:

Feature

Two-digit codes (71-94) can be programmed to dial external telephone numbers. Personal Speed Dial numbers are programmed for each telephone, and can be used only at the telephone on which they are programmed.

Pickup Group:Feature

A telephone can be placed into one of nine call pickup groups. A call ringing at a telephone within a pickup group can be picked up at any other telephone within the same pickup group. A telephone is assigned to a pickup group in Administration programming.

Pool: See Line pool.

Portable telephone: See Companion portable telephone

Pre-dial: A feature that allows you to enter a number and check it on your telephone display before it is actually dialed. If the number is incorrect, you can edit it. The number is dialed only when you pick up the receiver or select a line.

Prime line: The line on your telephone that is automatically selected when you lift the receiver, press the Handsfree/Mute button or use an external dialing feature. A Prime Line is assigned to a telephone in Configuration programming.

Prime Set (prime telephone): A telephone that provides backup answering for incoming calls on external lines. The prime telephone for a line will ring for any unanswered calls on that line. A prime telephone is assigned to a line in Configuration programming.

Priority Call:Feature

If you get a busy signal when you call someone in your office, you can interrupt them for an urgent call. This feature is enabled for a telephone in Administration programming.

Privacy: This feature determines whether a Norstar user may select a line in use at another telephone and join an established call. Privacy is enabled in Configuration programming, but can be turned on and off by users during individual calls.

Private line: See Private to.

Private network: A telephone network consisting of owned or leased telephone lines used to connect different offices of an organization independently of the public network.

Private to: A line can be assigned, in Configuration programming, to one telephone as a private line. The line cannot appear on any other telephone, except the prime telephone for that line. Private lines cannot be placed into line pools.

Programmed release:Feature

A feature that performs the function of the button in a programmed dialing sequence.

Programming: Setting the way the Norstar system will work. Programming includes system-wide settings and individual telephone and line settings.

Programming overlay: A paper template that is placed over the top four memory buttons with indicators on the M7310 or M7324 telephone during programming. The overlay labels indicate the special function that each of the four buttons takes on in programming.

Programming reminders: Charts on which you can record some commonly-used settings from Administration programming to keep the Norstar system's records up-to-date.

Public line: An external line that can be assigned to any telephone and to many telephones. A line is assigned as Public in Configuration programming.

Public network: The regular telephone network that connects most homes and businesses.

Pulse/tone dialing: An external line setting for pulse or tone dialing. Pulse is the traditional method of dialing used by rotary-dial or push-button single-line telephones. Tone dialing allows telephones to communicate with other devices such as answering machines. Tone dialing is required to access the features that PBX systems may offer or to use another Norstar system remotely.

R

Recall: See Link time.

Receiver: The handset of a telephone.

Regression Code: Restores the previous system security number so that previously applied UTAM Activation Codes and Portable Credit Codes can be reentered to restore full system operation. Also required in cases of system recovery. This code cannot be reused.

Remind delay: A feature that causes a telephone to beep and display the message

On hold: LINENAM when a call has been on hold for a programmable period of time. This period is the Remind delay.

Remote access: The ability to dial into a Norstar system from outside the system and make use of selected Norstar features. The lines, features, and dialing capabilities available to a remote user are determined by the Class of Service. If the remote access line is answered with DISA, the user must enter a Class of Service password to gain access to the Norstar system's features.

Remote access dial filter: See Remote filter.

Remote capability: A subset of Norstar features that are available to users connected through remote access.

Remote filter: A dialing filter applied to a line in order to control which digits can be dialed during an incoming remote access call. It is the equivalent of a set filter for a remote user.

Remote paging: This feature allows remote users to use the Norstar paging feature. Access to this feature is governed by the Class of Service for the call. See Remote Access and Class of Service.

Remote User: Someone who calls into a Norstar system from a telephone outside that system and uses Norstar features or lines. See Remote Access.

Restriction service: A Service Mode service that allows you to assign alternate dialing filters to lines, telephones, lines on a particular telephone, and alternate remote filters to lines at specified times of the day and on specified days.

Restrictions: One component of a Dialing filter. Restrictions are numbers you cannot dial when that dialing filter is in effect. See Exceptions.

Ring Again:

Feature 2

A feature that can be used when you can't get through to someone on your Norstar system because their telephone is busy or there is no answer. Ring Again instructs the Norstar system to inform you when they hang up or next use their telephone.

Ring type:

Feature * 6

A feature that allows you to select one of four distinctive rings for your telephone.

Ring volume:

Feature * 8 0

A feature that allows you to set the volume at which your telephone rings.

Ringing service: A Service Mode service that allows you to make additional telephones ring at specified times of the day and on specified days.

Rls button: The Release button ends a call in the same way that hanging up the receiver does. It may also be used to end Startup, Configuration programming, Administration programming, Maintenance sessions and feature operations.

Routing: See Routing service.

Routing service: A configuration programming feature that allows outgoing calls to be directed automatically based on the numbers a caller dials. For Norstar systems linked in a network, routing can create a transparent or coordinated dialing plan. It can also be used to direct calls to the least expensive lines according to a Service Mode schedule (sometimes called least cost routing).

Run/Stop:

Feature * 9

A feature that creates a break point in a programmed external dialing sequence. When you press a programmed key, the system dials the number up to the run/stop. When you press it again, the system dials the digits following the run/stop.

S

Saved Number Redial:

Feature 6 7

A feature that allows you to save the number of the external call you are on (providing you dialed the call) so that you can call it again later.

Selective line redirection: See Line Redirection.

Service Modes: A feature that places one or more lines into a Service Mode. Service Modes provides three services: Ringing service, Restriction service and Routing service. Service Modes settings are assigned in Administration programming.

Set: A telephone.

Set Copy: A programming section that allows you to copy programmable settings from one telephone to another of the same type. Set Copy provides two options: duplicating System Data and User Data, or duplicating System Data only. Set Copy does not provide the same copy capability as COPY, which is more selective of the settings that can be duplicated.

Set filter: See Dialing filter.

Set lock (telephone lock): This feature allows you to limit the number of features that may be used or programmed at a telephone. Full set lock allows very few changes or features, Partial set lock allows some changes and features, and No set lock allows any change to be made and any feature to be used. Set lock is assigned in Administration programming.

Set Profile: A feature you can use to review the settings that have been assigned in Configuration programming and Administration programming. The settings cannot be changed with this feature. Set profile is available only on the M7310 and M7324 telephones.

Set Relocation: See Automatic Telephone Relocation.

Shift button: A small triangular button beside the dual memory buttons on the upper half of the M7310 telephone. You press the shift button to store or access features on the top half of the dual memory buttons.

Show Time:

Feature

While on a call, accessing this feature lets you see the current date and time on the Norstar telephone display.

Startup programming: When a Norstar system is first installed and powered up, Startup programming must be performed before any programming can be done. Startup initializes the system programming to defaults.

Station: An individual telephone or other Norstar device.

Station Module: A module that allows you to connect up to 16 additional telephone to your Norstar system.

System coordinator: The person responsible for customizing the Norstar system through Administration programming and for helping co-workers use the Norstar system.

System Data: An option in the Set Copy function. System Data refers to the system settings that apply to all telephones and lines. System Data consists of the programmable settings from Startup programming and Administration programming. It also includes the settings programmed in Configuration programming.

System speed dial code: A Two-digit code (01 to 70) that can be programmed to dial a telephone number up to 24 digits long. System speed dial codes are programmed for the entire Norstar system in Administration programming.

System Startup: See Startup programming.

System Startup access code: To begin System Startup, press

Feature * * S T A R T

U P . An Installer password is required before Startup programming can begin.

System ID: The System ID (or System Security number) can be accessed on any M7324 or M7310 telephone display by pressing

Feature * * S Y S I D , or

Feature * * 7 9 7 4 3 .

T

T1: Digital carrier system or line that carries data at 1.544 Mbps.

Tandem call: A call established when a remote user dials into the Norstar system and uses the system to place an outgoing call. The combination of the incoming and outgoing calls forms a tandem call. See Remote Access.

Transfer:

Feature 7 0

A feature that lets you redirect a call to another telephone in your Norstar system, over a network or outside your Norstar system.

Transfer Callback: If a transferred call is not answered after a specific number of rings, the call will return to the telephone that made the transfer. The number of rings is assigned in Configuration programming. Transfer Callback does not apply to calls transferred externally.

Trunk: The physical connection between the Norstar system and the outside world using either the public telephone system or a private network.

Trunk Answer:

Feature 8 0 0

A feature you can use to answer a call on any line that has an active Ringing service Service Mode, even if that line does not appear on your telephone. Trunk Answer is enabled in Administration programming.

Trunk Module: A module that allows you to install additional Trunk Cartridges in your system to provide up to 12 additional trunks.

U

Unsupervised line: A line for which disconnect supervision is disabled. If an external caller hangs up, the Norstar system does not detect the disconnection and does not hang up its line. See Disconnect Supervision.

User Data: User Data is an option in the Set Copy feature. User Data refers to the personal settings that are unique to an individual telephone, and are not programmed in Configuration or Administration programming. User Data is programmed at each telephone.

These settings, for example, include Personal Speed Dial and the assignment of programmable memory buttons.

User Filter: See Dialing filter.

User Preferences: a programming section that lets you assign autodialers, user speed dial codes, display contrast, and other settings to a specific telephone or person. You do not have to program these settings at the person's telephone.

V

Voice Call:

Feature

A feature you can use to make an announcement or begin a conversation through the speaker of another telephone in the Norstar system. The telephone you call will not ring. Instead, the person you call will hear a beep and then your voice. Their telephone will beep periodically to remind them that their microphone is open.

Voice Call deny:

Feature

A feature that prevents your telephone from receiving Voice Calls.

Voice message center: If you have subscribed to Call Display services you can receive visual Voice Message Waiting Indication, providing your telephone has a display. If you have Voice Message Waiting Indication, you can program the telephone numbers required to access up to five different Voice Message Centers. You can also program which of the five Centers is to be accessed by each specific line.

W

Wait for dial tone:

Feature

A feature that causes of sequence of numbers to pause until dial tone is present on the line before continuing to dial. The Wait for dial tone symbol () uses two of the 24 spaces in a dialing sequence. This feature requires a Services or Combo Cartridge.

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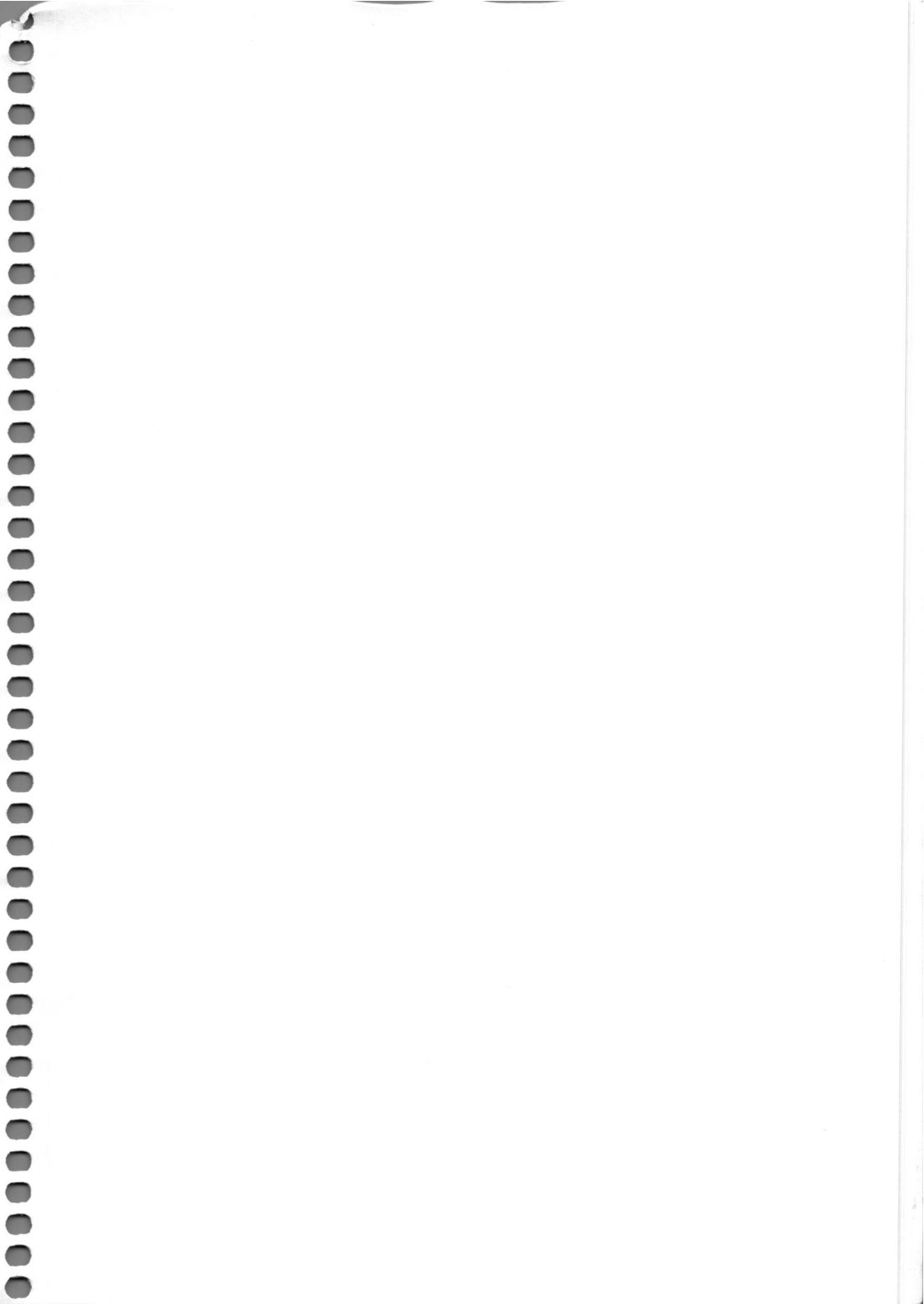
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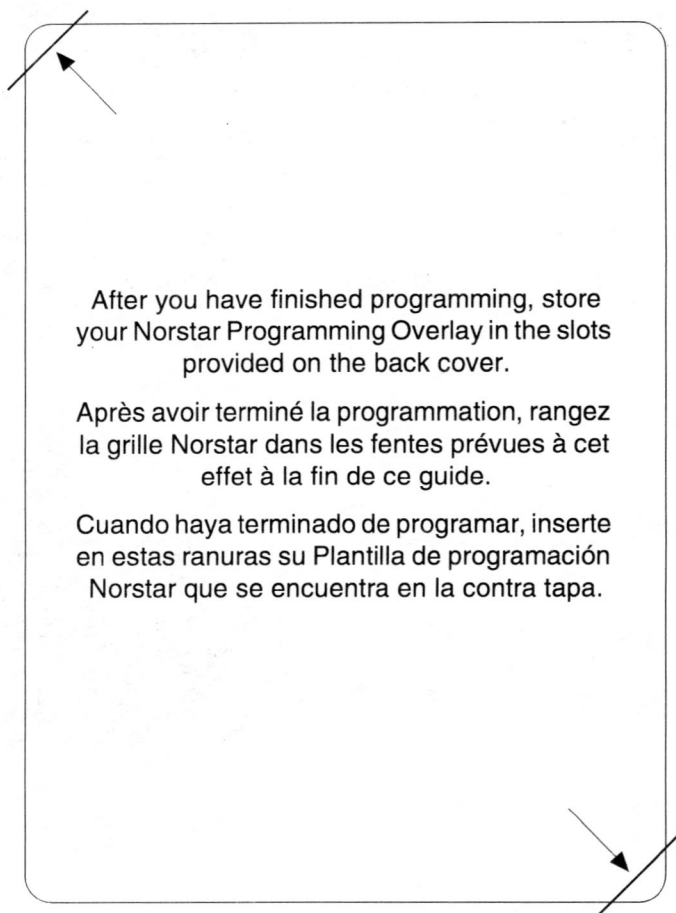
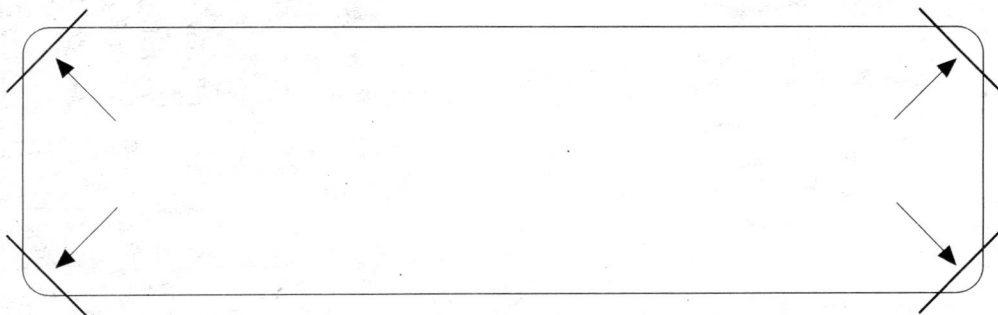
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After you have finished programming, store your Norstar Programming Overlay in the slots provided on the back cover.

Après avoir terminé la programmation, rangez la grille Norstar dans les fentes prévues à cet effet à la fin de ce guide.

Cuando haya terminado de programar, inserte en estas ranuras su Plantilla de programación Norstar que se encuentra en la contra tapa.

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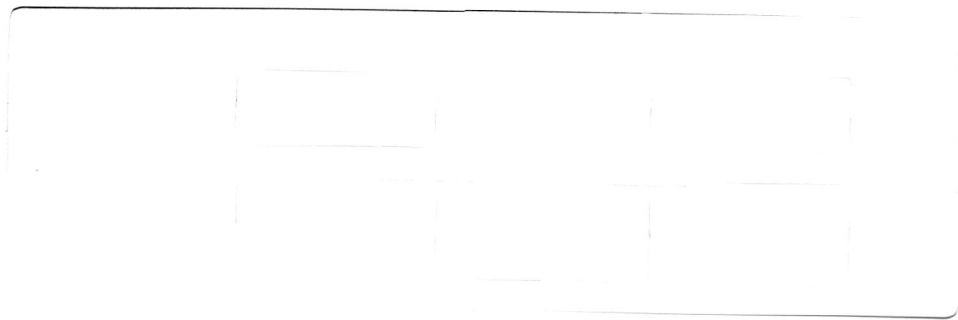
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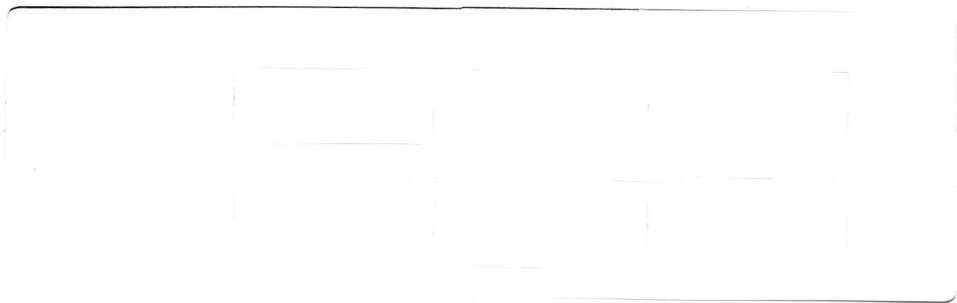
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